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### 1AC---Incumbents

#### Advantage 1 – Incumbents

#### The current legal regime protects digital incumbent interests and stifles the development of disruptive technology

Ohlhausen 20 [Maureen K. Ohlhausen chairs the antitrust group at Baker Botts LLP, J.D. with distinction from the George Mason University School of Law, 10-4-2020 https://gaidigitalreport.com/2020/10/04/occupational-licensure-in-digital-markets/#\_ftn2]

Introduction

Innovative technologies and business models are propelling the digital economy to its current heights, as well as serving consumer needs in response to unforeseen challenges caused by the COVID-19 pandemic. These technologies and business models are frequently disruptive and often bump up against restrictions that require the innovator to obtain some kind of government permission, such as a government license, to enter a market, which is a ‘Mother, May I?’ approach to competition.[1]

Relatedly, some new offerings in the digital economy are subject to the ‘Brother, May I?’ problem, which is the challenge of competitor control over market entry.[2] This problem arises when innovative technologies or business models are required to obtain permission from incumbent competitors to enter or expand within a certain market. This might be due to a financially-interested state board or conduct by a monopolist looking to maintain its market power.[3] A recurring version of the ‘Brother, May I?’ problem stems from occupational licensure.

Although occupational licensure can offer important benefits—such as protecting consumers from health and safety risks that are difficult for them to assess on their own—not all licensing is warranted. Indeed, licensing restrictions may impede competition and hamper entry into professional and services markets while offering few consumer benefits. These regulations may result in higher prices, lower quality, and reduced consumer access to services and goods, including healthcare. This is especially true with innovative entrants in the digital economy who are often denied the ability to compete in a traditionally regulated market. In the long run these unnecessary restrictions can cause lasting damage to competition, rendering markets less responsive to consumer demand and dampening incentives for innovation.

Incumbent competitors have strong incentives to raise barriers to competition that the state will enforce for them. When licensing establishes entry conditions for an occupation, only individuals who satisfy those conditions are legally authorized to provide the services associated with that occupation, which tends to reduce the number of market participants and benefit those who meet the qualifications by allowing them to charge higher prices.[4] Although antitrust law is normally a check on collective action by competitors to reduce competition, activities to seek government action, even anticompetitive action, are immune from liability under First Amendment protections.[5] And public choice scholars have explained the incentives legislators and regulators might have to adopt economically harmful limits such as unnecessary occupational licenses.[6]

To provide context for this chapter on the interplay between occupational licensing and digital markets, it is important to understand the underlying concepts that guide the antitrust analysis for control of market entry under the color of state law. Several Federal Trade Commission victories in court—North Carolina Dental[7] and Phoebe Putney[8]—established clearer boundaries between true state action, which is immune from antitrust law, and private action, which is not, a key distinction in combatting anticompetitive occupational licensure that requires competitor permission to enter a market. Anticompetitive occupational licensure has been extended to the digital economy when online companies have been forced out of markets where traditional brick and mortar competitors blocked entry—Teladoc,[9] Tennessee Wine and Spirits,[10] Hines,[11] and Vizaline.[12] With innovation flooding the digital economy, traditional brick and mortar competitors have sometimes used occupational licensure to prevent entry into the market. Although this chapter is focused primarily on antitrust challenges to occupational licensure, the array of cases affecting licensing of digital commerce discussed involves challenges on a variety of Constitutional grounds, including the Commerce Clause and the First and Fourteenth Amendments. Each case implicates the same underlying issue, however: state regulation to protect entrenched bricks and mortar entities from digital commerce.

This chapter proceeds as follows. Section I begins with the background and recent history of the state action doctrine and its relation to occupational licensure, addressing the recent cases listed above. Section II discusses recent and current litigation involving competitors using the ‘Brother, May I?’ approach to prevent new technology in the digital economy from entering the market. Section III argues that the FTC’s targeted efforts in North Carolina Dental and Teladoc should extend to current issues in the digital economy by narrowing the use of occupational licensure for health services to regulations that actually protect health and safety. Section IV discusses the Commerce Clause implications caused by occupational licensure on new technology in the digital economy. Section V concludes this chapter.

I. The State Action Doctrine and State Licensing Boards

The state action doctrine—first announced in the 1943 U.S. Supreme Court opinion, Parker v. Brown,[13]—gives certain state decisions protection from the reach of the Sherman Act. The Court reasoned that “in light of states’ sovereign status and principles of federalism, Congress would not have intruded on state prerogatives through the Sherman Act without expressly saying so.”[14] The Parker Court set a threshold inquiry for invoking state action immunity, which is whether the anticompetitive action was by the sovereign or by a private party.

State action immunity has been modified doctrinally through the years. Four decades after creation of the state action doctrine, the Supreme Court limited its scope by creating a two-part test in California Retail Liquor Dealers Assn v. Midcal Aluminum, Inc.[15] First, the defendant claiming the immunity must demonstrate that the conduct in question was in conformity with a “clearly articulated” state policy. Second, the defendant must demonstrate that the state engaged in “active supervision” of the conduct.

The Midcal test limited the use of the state action doctrine by creating political accountability for state legislators that choose to displace competition through regulation. However, even with these limitations, the problem of private competitors claiming the protection of state authority to shield their private efforts to exclude competitors remains, and the FTC therefore undertook an organized effort to bring further clarity to the state action doctrine through scholarly research and targeted case selection.[16] The Phoebe Putney and North Carolina Dental decisions represent not only a narrowed interpretation of antitrust immunity under the state action doctrine but highlight the issues with state regulation and occupational licensure.

A. Phoebe Putney and Certificate of Need Laws

In April 2011 the FTC filed a complaint challenging a merger involving a local hospital authority in Albany, Georgia.[17] The parties arranged to have the local hospital authority acquire Palmyra Park Hospital from HCA Inc. and then transfer all management control of the hospital to Phoebe Putney Health System, Inc. Although the transaction represented a virtual merger-to-monopoly, both the district court and Eleventh Circuit Court of Appeals granted and affirmed the defendants’ motion to dismiss on state action grounds.[18]

The FTC then turned to the Supreme Court, which in a unanimous 2013 decision sided with the agency.[19] For their actions to be immune from antitrust laws under the state action doctrine, private entities must demonstrate the state “clearly articulated and affirmatively expressed” a policy displacing competition and thus allowing the otherwise anticompetitive conduct at issue.[20] The Court held that a general grant of corporate powers to a private entity is insufficient by itself to satisfy the clear articulation prong of Midcal.[21] Therefore, the challenged transaction was not immune from antitrust scrutiny, and the case was remanded for further proceedings.

The FTC complaint counsel resumed the administrative litigation that had been stayed. It did not take very long, however, before the agency recognized a potentially insurmountable hurdle to a successful resolution of this case: the Georgia certificate of need (“CON”) laws.

CON laws establish requirements for state approval before a new health care provider can enter a market or an existing provider can make certain capital improvements, a classic “Brother May I?” situation.[22] Normally, states are not directly involved in the entry or improvement decisions of private firms except for requiring firms to comply with zoning laws and other general commercial regulations. However, CON laws were created so that the state could step in and prevent competing hospitals from purchasing equipment that would sit idle to keep up with other competing hospitals, which was claimed to prevent waste and lower health care costs. Although a small number of studies identify some very modest benefits from CON laws, the majority of studies fail to establish any definitive link between CON laws and lower unit costs.[23] Even with the lack of conclusive data showing an increase in consumer welfare through CON laws and the presence of other laws that ensure patient safety about two-thirds of states continue to use the antiquated regulation.[24]

Georgia is one of those states, and even if the Commission could have established antitrust liability, which was likely for a merger to monopoly, the state CON laws would have prevented a divestiture of any hospital assets.[25] Because the Albany region was deemed ‘over-bedded’ it was unlikely that a divestiture buyer could obtain CON approval, which forced the FTC to finalize a consent agreement with Phoebe Putney without divestiture.[26]

There are several takeaways from the Phoebe Putney matter. Importantly, the Supreme Court decision narrowing the state action doctrine is a significant victory for competition principles. It is also a reminder of the anticompetitive nature of laws that effectively give competitors veto power over new market entry.

B. North Carolina Dental, State Licensing Boards Run by Market Participants

In 2010, the FTC filed an administrative complaint in North Carolina Dental, alleging that the State Board—through its dentist-members—was “colluding to exclude non-dentists from competing with dentists in the provision of teeth whitening services.”[27] The Board, after deciding that whitening teeth constitutes the practice of dentistry, issued letters to non-dentist providers and their landlords, stating they were illegally practicing dentistry without a license and ordering them to cease and desist.

Prior to the administrative trial over the alleged violation of § 1 of the Sherman Act, the Board filed a motion to dismiss—arguing immunity under the state action doctrine.[28] The FTC, in a unanimous opinion, held that “a state regulatory body that is controlled by participants in the very industry it purports to regulate must satisfy both prongs of Midcal to be exempted from antitrust scrutiny under the state action doctrine.”[29] The Commission further found that the decision to classify teeth whitening as the practice of dentistry and to enforce cease and desist orders based on that decision failed to demonstrate ‘active supervision’ by the state under the Midcal test.[30]

On appeal, the Fourth Circuit Court of Appeals denied the Board’s petition for review of the FTC’s order and affirmed the decision.[31] In 2015, the Supreme Court ruled in the Commission’s favor, holding that “a state board on which a controlling number of decisionmakers are active market participants in the occupation the board regulates must satisfy Midcal’s active supervision requirement in order to invoke state-action antitrust immunity.”[32] A few aspects of the Court’s opinion stand out.

First, the Court explained while citing Phoebe Putney that, “given the fundamental national values of free enterprise and economic competition that are embodied in the federal antitrust laws, ‘state action immunity is disfavored, much as are repeals by implication.”’[33] Next, the Court focused on political accountability. After rejecting the idea that state agencies are sovereign actors, the Court contrasted state agencies to municipalities.[34] Most significantly, the Court noted that “municipalities are electorally accountable and lack the kind of private incentives characteristic of active participants in the market.”[35] Finally, the Court briefly addressed the issue of active supervision as it relates to a state agency controlled by market participants. Although the Court made clear that day-to-day involvement in agency operations is not required, it identified a few constant requirements of active supervision:

(1) Review [of] the substance of the anticompetitive decision, not merely the procedures followed to produce it; (2) supervisory ‘power to veto or modify particular decisions to ensure they accord with state policy;’ (3) the ‘mere potential for state supervision’ is insufficient; and (4) ‘the state supervisor may not itself be an active market participant.’[36]

Unlike Phoebe Putney, this decision was not unanimous, and the dissent took issue with immunity not applying to state-created agencies. The dissenting Justices further identified several questions left unanswered by the majority:

(1) What is a “controlling number” of decision makers?; (2) Who is an “active market participant?”; and (3) What is the scope of the market in which a member may not participate while serving on the board?[37]

North Carolina Dental was an essential victory for competition and consumers as it forced states to be held politically accountable for how they choose to meddle in the competitive system.[38] Where there is a benefit concentrated in the hands of a small number of incumbent providers and the competitive harm is dispersed across all consumers of health care services, public choice theory predicts such incumbent exploitation of state licensing laws and regulations.[39] The adverse competitive results of this are manifest and is the regulated replacing and acting as the regulators.[40]

Both Phoebe Putney and North Carolina Dental exemplify the anticompetitive nature of the ‘Brother, May I?’ approach to regulation. Moreover, they illustrate how state licensure requirements can be a tool to fence out competition, a problem that becomes even more acute for the multi-state digital economy.

II. Occupational Licensure in the Digital Economy

The digital economy is, simply put, the economic activity and connection of businesses online including sales, data collection, communication, and devices. As internet use increases and technology improves, the ability for traditionally in person sectors of the economy to transition to the online marketplace follows suit. In the age of COVID-19 it is apparent that the digital economy is an essential and permanent fixture in the economy at large.

As early as 2004, the FTC engaged in studies regarding the use of occupational licensure in the digital economy as seen in its 2004 E-Commerce contact lenses report.[41] The FTC, after decades of enforcement in the eye care industry—including the enforcement of the Eyeglass Rule, which requires an eyecare provider to give a patient, at no extra cost, a copy their eyeglass prescription after completion of an eye exam[42]—found that the benefits associated with requiring third party online sellers of replacement contact lenses to obtain a license increased the cost of replacement lenses.[43] These increased costs would actually harm public health by inducing consumers to replace the lenses less frequently than doctors recommend or to substitute other forms of contact lenses that pose greater health risks. In sum, the added barrier to online sellers of contact lenses reduced competition and consumer choice in the entire market.[44]

Issues such as those presented in the FTC Contact Lenses Report appear in numerous other industries and board decisions to increase licensure requirements when incumbents feel pressure from new competitors in the digital economy. This section will address examples of recent matters involving occupational licensure in the digital economy for online practice by doctors and veterinarians, online sales of liquor and wine, and online map making. Each example shows how occupational licensing regimes are prone to misuse in innovative markets controlled by strong incumbents.

A. Teladoc, Inc. v. Texas Medical Board: Occupational Licensure of Online Medical Practice

When innovative new entrants threaten to disrupt a market with strong incumbents, these incumbents may erect rules and regulations through occupational licensure to preserve the status quo. The case of Teladoc, Inc v. Texas Medical Board[45]is a timely example of rules that not only thwart entry but also threaten consumers’ health. The Texas Medical Board (“TMB”), filled primarily with active physicians, enacted a rule that would greatly reduce a patient’s ability to obtain medical care from online Teladoc physicians.

Teladoc employed “board certified physicians who are provided specialized training in treatment and diagnosis via telephone.”[46] After a patient requested a consultation with Teladoc, the physician would typically review the patient’s information and medical records prior to calling the patient for more information. On the phone call, the Teladoc physician would use the background information combined with any additional information offered by the patient or solicited by the physician to offer medical advice.[47] The medical advice could range from referring the patient to an in person doctor’s appointment, suggesting emergency room visits, or prescribing certain medications—Teladoc did not prescribe “DEA-controlled substances (including narcotics).”[48]

However, the TMB, in 2015, changed its rules to require a “face-to-face visit or in-person evaluation” before a physician could issue any prescription.[49] Teladoc challenged the revision claiming it violated federal antitrust laws and would increase prices while reducing choice, access, innovation, and overall supply.[50] The prominent issue in the litigation was state action immunity and more specifically whether the TMB met the active supervision requirement as set forth in North Carolina Dental.[51] Although TMB argued that it was subject to supervision through judicial review by the courts of Texas, the State Office of Administrative Hearings, and the Texas Legislature, the court found these types of review were “limited and fail[ed] to confer on the reviewing court a method for looking to whether the decision of the TMB is ‘in accord with state policy.’”[52] In sum the TMB was the type of board the North Carolina Dental Court predicted could create anticompetitive rules if not held politically accountable by active supervision.

The FTC recognized the anticompetitive effects that could flow from such regulations “especially. . . in medically underserved areas or with medically underserved populations” much like the conditions that exist in Texas.[53] Moreover, TMB’s rule would have imposed costs upon patients in Texas because the occupational licensing regime excluded board-certified entrants, and reduced patient access to those new entrants, which in turn raised prices and reduced output. Following the outcome in this case, Texas chose to remove the restriction on online medical practice, thereby allowing greater access to medical treatment in rural areas.

This case demonstrates how antitrust laws can intervene to protect consumers from these abuses. In the current COVID-19 crisis the benefits of online medicine are clear. Yet, the ‘Brother, May I?’ approach by the TMB highlights the potentially catastrophic effects that occupational licensure can have on innovation and consumer welfare.

B. Hines v. Quillivan: Occupational Licensure of Online Veterinary Practice

A few years after Texas lessened restrictions on medical practice online, a veterinarian filed an equal protection claim for his online veterinary practice. The Texas State Board of Veterinary Examiners shut down and fined Dr. Ronald Hines’ online practice because it violated the Texas statute establishing veterinarian-client-relationship.[54] Dr. Hines’ case has a similar feel to Teladoc, but differs slightly because the Board of Veterinary Examiners enforced a new statute passed by the state legislature rather than creating its own rule. Yet, even with a statute, this case shows the effects that a board of market participants can have to influence a legislature to pass a law that would prevent innovative entrants from coming to market. Moreover, this case presents constitutional law issues that complicate the ability of online platforms to compete with in-state incumbents.

This section will give a brief background of the Hines I[55] case brought by Mr. Hines prior to the decision in Teladoc. Next, this section will outline the arguments made in Hines II[56], currently before the Fifth Circuit. Finally, this section will compare the effects of the licensure requirements on consumers in online medical practice and online veterinary practice.

1. Hines I: ‘Brother May, I?’ and the Constitution

From 2002 to 2012, Dr. Hines gave veterinary advice both generally via his website and directly to patients who solicited his expertise.[57] Hines provided advice to various groups of people such as pet owners who had no access to conventional veterinary care—either because of geography and/or inability to pay—and other pet owners who might have received conflicting diagnoses.[58] However, Hines never attempted to serve as any patient’s primary veterinarian by providing medication, performing procedures, or physically examining the animal.[59] In fact, on his website, Hines advised any visitors that his advice was inherently limited and he “[did] not provide any advice or accept payment if in his professional judgment doing so would [have been] inappropriate.”[60]

In 2012, the Texas State Board of Veterinary Examiners (“TBVE”) informed Hines that he was in violation of Tex. Occ. Code § 801.351,[61] which prohibited veterinarians from providing veterinary advice without first establishing a veterinarian-client-patient relationship. In 2005, the state legislature amended the statutory provision to require a veterinarian-client-patient relationship before practicing and expressly excluded forming a relationship “solely by telephone or electronic means.”[62] In passing the amendment, the legislature recognized the TBVE’s claim that the veterinarian-client-patient relationship was a cornerstone of a veterinarian’s care of animals and veterinarians could circumvent that relationship via new technology.[63]

Dr. Hines’ violation of the statute was based on his failure to physically examine the animals about which he provided advice.[64] The TBVE ordered a one-year suspension of his veterinary license, required him to retake portions of the veterinary licensing exam, and imposed a $500 fine.[65] Hines filed a complaint for injunctive relief claiming violations of his rights under the First Amendment, Fourteenth Amendment substantive due process, and Fourteenth Amendment equal protection.[66]

The district court dismissed the equal protection and due process claims concluding that “because the law did not discriminate on the basis of any suspect classification, the count was evaluated pursuant to rational basis review—and held that the physical examination requirement passed that deferential standard.”[67] However, the district court denied the defendants’ motion to dismiss the First Amendment claims. On appeal the Fifth Circuit affirmed the district court’s Fourteenth amendment holding but reversed and remanded the First Amendment claim in favor of the defendant.[68] The Fifth Circuit explained that this restriction on the veterinary practice is within the scope of state regulation, and any effects on Dr. Hines’ First Amendment rights were incidental to the constraint and therefore did not violate the constitution.[69]

In 2017, Texas Governor Greg Abbot signed SB 1107, which allowed medical doctors to practice telemedicine in Texas without an in-person examination. And shortly after in June 2018, the U.S. Supreme Court explained there is no professional-speech exception to the First Amendment in NIFLA v. Becerra.[70] The Court explained that “professional speech” is difficult to define as all it embodies is a profession that requires a license from the state.[71] But if that is the case it “gives the States unfettered power to reduce a group’s First Amendment rights by simply imposing a licensing requirement.”[72] In conclusion the Court found that there was not a “persuasive reason for treating professional speech as a unique category that is exempt from ordinary First Amendment principles.”[73] With this new ruling by the Supreme Court changing controlling constitutional law, Dr. Hines was able to bring his First Amendment suit again under the res judicata exception.

2. Hines II: Operating a Tele-practice

On June 11, 2019, the United States District Court for the Southern District of Texas decided Hines’ second case in the court.[74] Dr. Hines argued that the NIFLA holding and Tex. Occ. Code § 111.005,[75] the new telemedicine rule, breathed life into his First Amendment and Fourteenth Amendment due process claims respectively.[76] Again, defendants sought a motion to dismiss all of Hines’ claims.

The district court disagreed with Hines’ claim that NIFLA abrogated the Fifth Circuit’s decision in Hines I.[77] The court held that NIFLA did not reference Hines I nor did it make a statement that directly contradicts the Fifth Circuits opinion.[78] In sum, the court concluded that Hines’ argument was that the Fifth Circuit reached an erroneous conclusion and under the rule of orderliness, the district court cannot reconsider that decision.[79]

Next, the court addressed the Equal Protection Clause claim, noting that Hines I does not foreclose the current claim.[80] Hines I turned on the difference between veterinarians who saw animals in person and those who had not. Hines II focuses on the different treatment between doctors who can perform telemedicine on human patients and veterinarians who cannot perform telemedicine on animals.[81] Dr. Hines argued that the new law for doctors required the court to determine whether the Board has a rational basis to maintain the in-person requirement for veterinarians when Texas law removed the same requirement for doctors treating humans.[82] The district court found that the Board presented two reasons that form a rational basis. First, because animals cannot speak as humans can speak, a physical examination is important because without one the veterinarian would have to rely on the animal’s owner to convey information about symptoms.[83] Second, because owners lack knowledge about animal physiology, the information conveyed would likely lack accuracy.[84]

For these reasons the district court granted defendants motion to dismiss all claims. Hines has appealed the decision and oral arguments have been made to the Fifth Circuit. As of now the Fifth Circuit has not released its decision. The similarities between Hines I-II and Teladoc are clear. The incumbent veterinarians who sit on the TBVE have prevented the market entry of an innovative supplement to traditional veterinary practice. However, the difference is that a Texas Statute has given them the ability to restrict the market. Although Hines is not argued as a state action doctrine case, the effects of occupational licensure remain the same.

C. Vizaline, L.L.C. v. Tracy: Occupational Licensure in Non-Medical Fields

The Fifth Circuit recently applied the NIFLA Court’s professional speech analysis to an innovative map making online competitor in Mississippi. In Vizaline,[85] the Mississippi Board of Licensure for Professional Engineers and Surveyors (“Mississippi Board”) claims Vizaline is partaking in the unlicensed practice of surveying. Like both Teladoc and Hines, the State Board is looking to squelch an innovative online entrant to the market through occupational licensure.

Vizaline is an important test for the state action doctrine and occupational licensure. First, the case revolves around a state licensing board’s determination that a novel process for map making constitutes the practice of surveying and therefore is under the board’s jurisdiction. Next, it expands the NIFLA professional speech analysis to the Fifth Circuit. Finally, this again exemplifies the issue that occurs when incumbents can stifle the entry of competing business models through the use of occupational licensure.

1. The Background of Vizaline

Vizaline, a Mississippi technology startup, “converts existing metes-and-bounds descriptions of real property into ‘simple map[s]’ . . . through a computer program that overlays lines onto satellite images.”[86] The company sells these maps exclusively to community banks for small, less expensive properties that serve as loan collateral. These banks would normally have to use a costly in-person survey for these properties. Vizaline has never held itself out to be a surveyor. In fact, Vizaline stated it does not “establish or purport to establish metes and bounds descriptions of property . . . [n]or does it locate, relocate, establish, reestablish, lay out, or retrace any property boundary or easement.”[87] Moreover, Vizaline does not market its product as a replacement for a legal survey and alerts its customers that it is not a legal survey. If Vizaline encounters discrepancies in its drawings, it recommends its customers hire a licensed surveyor to correct the issue. Currently, the company has six employees and operates in five states.[88]

In Mississippi, the practice of surveying is regulated by the Mississippi Board in accordance with Miss. Code § 73-13-95 which states, “Any person who shall practice, or offer to practice, surveying in this state without being licensed. . . shall be guilty of a misdemeanor.”[89] In particular, the Mississippi Board alleged that Vizaline violated Mississippi Code § 73-13-95(c), which prohibits “‘receiv[ing] any fee’ for performing ‘any service, work, act or thing which is any part of the practice of surveying’ without a surveying license.”[90] The Mississippi Board, prior to bringing a lawsuit against Vizaline, asked the company to revise its website to not market to the general public and clarify it is not to be used as a survey—Vizaline complied.[91] Two years after its requests, the Mississippi Board sought an injunction against Vizaline’s business and disgorgement of all compensation. In response to the requested injunction Vizaline filed a lawsuit claiming the Mississippi rule violated the First Amendment.

2. The Fifth Circuit Ends Professional Speech Protection for States

The district court took a similar view to that in Hines and promptly dismissed Vizaline’s First Amendment claim.[92] The district court found that the state, using its broad power to establish licensing standards and oversee professions, regulated “professional conduct which incidentally involves speech.”[93] In sum, the district court held that occupational licensing restrictions were categorically exempt from First Amendment scrutiny.

On appeal, the Fifth Circuit disagreed, citing NIFLA for the proposition that “occupational-licensing provisions are entitled to no special exception from otherwise-applicable First Amendment protections.”[94] The Fifth Circuit went on to explain that it and other circuit courts had invoked the “professional speech” doctrine, which addressed any speech by individuals that is based on their expert knowledge and judgment or which occurred within a professional relationship.[95] These courts had held that a statute that creates occupational licensure standards was not unconstitutional for violating First Amendment rights because it was an incidental effect of a legitimate regulation.[96]

The Fifth Circuit recognized that NIFLA replaced the Fifth Circuit’s previous analysis of occupational licensure requirements with a conduct-versus-speech dichotomy.[97] What this means is that First Amendment challenges do not turn on whether the regulation is occupational licensure, but whether the regulation is directed at conduct, rather than speech, and does not run afoul First Amendment protections.[98] The court reversed and remanded the lower court’s decision because there was no First Amendment scrutiny for the Mississippi Board’s licensing requirements.[99] The Fifth Circuit did not address whether the restrictions violated the First Amendment or what role Mississippi should have in regulating Vizaline’s practice but emphatically put an end to the “professional speech” exception.[100]

These cases illustrate that a growing concern of over-regulation by states has led to constitutional challenges of several occupational licensure requirements affecting digital commerce. Whether these challenges will have a lasting effect on occupation licensing overall is yet to be seen. But, with each challenge the same underlying principle issues remain—state regulation to protect entrenched bricks and mortar entities from digital commerce ends with less innovation, reduced access for consumers, higher prices, and the reduction of competition in the regulated industry.

D. Tenn. Wine & Spirits Retailers Ass’n v. Thomas: Occupational Licensure’s Effect on Interstate Commerce

Licensure requirements might also unreasonably burden out of state companies and create conflicts with interstate commerce. Moreover, in the digital economy, a company might sell its products to a number of different states through an online platform, which means a state regulation that favors in-state firms would directly affect online sales. This issue brings to light yet another constitutional question relating to state regulation through occupational licensure.

The Twenty-first Amendment gives each state leeway in choosing alcohol-related public health and safety measures and most states have done so through state regulatory boards. In Tennessee, alcohol is regulated through the Tennessee Alcoholic Beverage Commission (“TABC”). In 2012, the Supreme Court of the United States granted certiorari to decide if a TABC regulation on alcohol retail violated the Commerce Clause. Much like the First Amendment arguments made in the above cases, state regulation that violates the Commerce Clause causes reductions in competition. The Supreme Court, in Tenn. Wine & Spirits Retailers Ass’n v. Thomas,[101] held that a TABC two-year residency requirement violated the Commerce Clause because its predominant effect was to protect in-state vendors from out-of-state competition.

1. Tennessee Wine and Spirits Background

Tennessee requires alcohol distribution to flow through a three-tier system.[102] Producers may only sell to licensed wholesalers who may only sell to licensed retailers who are the only group allowed to sell to consumers.[103] This means that no entity may sell alcohol without a license.[104] The tiered system also contained residency requirement to obtain a license. For any retailer to obtain a license to sell alcohol for home consumption, the retailer must demonstrate that it has been a “bona fide resident” of the state for two years.[105] Moreover, a corporation could not get a retail license unless all of its “officers, directors and owners of capital stock satisfy the durational requirements applicable to individuals.”[106]

In 2016, two national chain liquor stores, Total Wine and Affluere, applied for a license to retail alcohol in Tennessee.[107] The TABC recommended approval of the application until the Tennessee Wine and Spirits Retailers Association (“Spirits Association”)—an in-state liquor trade association—threatened to sue the TABC if it granted the license.[108] The TABC decided to file a declaratory judgment regarding the constitutionality of the residency requirements.[109] The district court held that the requirements were unconstitutional.[110]

The Spirits Association appealed to the Sixth Circuit, which affirmed the district court decision. The court split on the 2-year residency requirement. The majority affirmed the lower court’s decision using a dormant Commerce Clause argument—the requirement facially discriminated against interstate commerce and the interests the requirement was meant to further could adequately be served by nondiscriminatory alternatives.[111] The dissent, however, claimed that the Twenty-first Amendment granted states limitless authority to regulate in state alcohol distribution unless it served no purpose besides “economic protectionism.”[112] The Spirit Association filed a petition for certiorari regarding the two-year residency requirement, which was granted by the Supreme Court.[113]

2. The Supreme Court Strikes Down the Two-Year Residency Requirement

The Supreme Court in a 7-2 opinion held that the two-year restriction was unconstitutional. The majority framed the opinion as a dormant Commerce Clause issue. Under the dormant Commerce Clause, a state law that discriminates against out-of-state goods or economic actors is unconstitutional unless it is “narrowly tailored to advance[e] a legitimate local purpose.”[114] The Court found that the two-year residency requirement plainly favored in-state residents and that the Spirit Association did not make a Commerce Clause argument but instead chose to argue under the Twenty-first Amendment.[115]

The majority held that if the Twenty-first Amendment were read to take precedence over the Commerce Clause it would lead to an absurd result.[116] For example, if the Twenty-first Amendment trumped any previous section of the constitution, a state could enact laws prohibiting the sale of alcohol to a particular race or religion despite the Equal Protection Clause, or prohibit the sale of alcohol to people who express an unpopular point of view despite the First Amendment.[117] Instead, the Twenty-first Amendment should be viewed as “one part of a unified constitutional scheme.”[118] Moreover, the Court cited Midcal as an example of the Twenty-first Amendment’s limits, noting that when state alcohol laws conflict with federal regulation of the export of alcohol, that is deemed unconstitutional.[119]

Because the residency law directly conflicted with the dormant Commerce Clause, the Court looked to the purpose of the law and whether it had a legitimate interest in furthering the health and safety of citizens consuming alcohol and found that it did not.[120] When a purpose is “mere speculation” or an “unsupported assertion,” it is not immune from violating the Commerce Clause.[121] The Spirit Association presented no evidence that tied the residency requirement to the protection of public health and safety subjecting the law to Commerce Clause scrutiny.[122] Because the predominant effect of the residency requirement was to protect the Spirit Association’s members from out-of-state competition and it lacked a nexus to protecting public health and safety, the Court struck down the requirement.[123]

Although the Court only made passing reference to antitrust issues this case, it still exemplifies the issues that out-of-state online firms face when trying to enter a market that is regulated by state occupational licensure. Both national liquor retailers at issue in Tennessee Wine & Spirits had an online presence that was stifled by the unconstitutional barrier to market entry. And while states have the right to regulate to protect public health and safety, occupational licensing requirements that lack a nexus to that purpose tend to harm consumers and competition.

III. Narrowing Occupational Licensure to Protect Public Health and Safety

Occupational licensure, in its most appropriate form, allows a state to protect the health and safety of its citizens through requirements created by a politically accountable state board. However, a state board run by market participants without state supervision loses political accountability, which often leads to overreaching requirements that in the end harm consumers. As illustrated in the above cases, when state regulations stray from protecting public health and safety it can lead to a flurry of constitutional questions.

In the increasingly digital economy, occupational licensure prevents innovative firms from entering markets under the guise of protecting consumers. Teladoc, Hines, and Vizaline illustrate this principal. Like Phoebe Putney and North Carolina Dental, these three cases show the expansion of occupational licensure arising from an overly broad delegation of authority to protect public health and safety, which allows incumbents to choose whether new competitors and new technologies can enter a market, unmoored from legitimate health and safety concerns. While new technologies may offer new market options to consumers, they may also have adverse effects on health and safety, and, in these instances, occupational licensure may be justified.

#### ‘Sustaining innovation’ and digitization are inevitable but disruptive digital technology convergence is distinct and solves extinction

Tyfield 18 [David Tyfield, Lancaster Environment Centre, Lancaster University, UK & Joint Institute for the Environment (JIE), March 2018 https://www.sciencedirect.com/science/article/pii/S2214629617303523]

1. Disruptive low-carbon innovation revisited

Wholesale low-carbon transition is urgently needed to stay within 1.5 °C limits, but remains elusive [1]. Could disruptive low-carbon innovation (DLCI) help regarding this imperative?

The idea of DLCI was first raised 10 years ago [2], and subsequently taken up with special focus on developing countries [3], especially China [4], [5]. What is DLCI and why is it important? Against the stream of current discussion [6], our starting point here is the seminal work of Christensen [7]. While addressing a business strategy readership and not specifically concerned with low-carbon transition, Christensen’s work nonetheless furnishes a broad but rigorous definition of ‘disruptive innovation’ (DI). This concerns “cheaper, easier-to-use alternatives to existing products or services often produced by non-traditional players that target previously ignored customers” [2] and/or their use in novel contexts and combinations. This contrasts disruptive innovation with ‘sustaining innovation’ along existing, stabilized techno-economic trajectories. The former thus effects a social redefinition of existing technologies through recombination, thereby offering possibly lower functionality against existing metrics initially. Over time, though, such innovation may ‘disrupt’ at varying levels, as new low-cost offerings attract not only users previously unable to afford these technological affordances, but also increasingly the incumbent ‘mainstream’ market.

The particular promise of low-carbon DI rests in precisely these characteristics: low-cost, rapid (driven by its own spontaneous demand) global deployment of existing technologies in novel combinations (and incremental improvements thereof) can be favourably compared with the default (and stalling) model of low-carbon transition. The latter focuses on supply or production of high-cost new-to-the-world technologies from high-risk, slow and uncertain RDD&D processes. Aligning with and corroborating criticisms of this dominant techno-fetishistic narrative, a focus on such DLCI, and its social redefinition of (probably existing) technologies, also directly opens up the importance of socio-technological and systems issues [8].

These arguments are still pertinent today, and I welcome that DLCI is getting a new and arguably more high-profile hearing, amplified through Future Earth and this SI. But in this paper I also want to go beyond restatement of this original case to update and extend that argument in light of both more recent, clearer evidence of challenges and positive trends, and developments in theoretical understanding. In brief, this involves three key steps, set out in much greater detail in [9]:

* Reframing understanding of low-carbon transition and innovation, including DI, as not just a socio-technical system process but one of power/knowledge.
* From this perspective, appraising the nature and importance of digital innovation to both low-carbon innovation and disruptive innovation (and their conjunction).
* Illustrating and developing these arguments with the contemporary geographical exemplar of such disruptive (digital and/or low-carbon) innovation, namely China.

Along the way I also not only reaffirm the Christensen point that there is a specific form of innovation that merits its own label – ‘disruptive innovation’ – and that conflating this with innovation per se is to evacuate the term of any useful rigorous analytical meaning. But also, and stronger, I argue that the predominant contemporary manifestation of that conceptual laxity – in which Silicon Valley ‘Tech’ is widely imagined as the archetype of ‘disruptive innovation’ – is not merely obfuscating but actively complicit in reproducing the problem low-carbon transition is trying to tackle. In short, if we accept this commonplace (mis)interpretation, then ‘disruptive innovation’ is part of the problem, not the ‘solution’.

Given that the public sphere is (rightly!) more powerful in determining the meanings of terms than academic argument (which may of course participate in the former), it is tempting to drop ‘disruptive’ innovation altogether and replace it with another term (e.g. ‘game-changing’, or, in Chinese, ‘poju’ (see [4]1). But given that this special issue – and broader initiative – is aiming to illuminate the crucial role that DLCI could play in the greatest challenge of our time – let alone that it was Christensen’s coining initially – it seems legitimate still to fight for the meaning of ‘disruptive innovation’, as I do here.

2. Complex power/knowledge systems, their government and their transition

Our first contention is that to understand DLCI and its importance, and indeed low-carbon transition itself, we need to adopt a complex power/knowledge systems (CPKS) perspective. This conceptualizes the problem field of low-carbon transition, and innovation more generally, not just as multi-agent, multi-factorial (and hence socio-technical) and multi-levelled (e.g. [10], hence ‘MLP’) systems, as is increasingly the orthodoxy in innovation studies. They are also, and essentially, composed of complex, dynamic assemblages of relatively sedimented relations and technologies of power/knowledge [11], [12], [13].

I use the combined term ‘power/knowledge’ to indicate the specific conceptualisation of power drawn on in this perspective, inspired by the later work of Michel Foucault. In brief, this presentation aims to shorthand how power and knowledge are different but inseparable aspects of the same (strategic, relational and practiced) phenomenon, not completely different issues. Hence even academic knowledge must be primarily assessed in terms of what it does and enables (or disables) in the world and how, not just in terms of the representative truth of what it says; while conversely, even the heights of ‘power politics’ must be analysed in terms of how they manipulate and successfully dominate others, not least through their deployment and development of particular knowledge claims and practices, as ‘power/knowledge technologies’. For example, Google’s or Facebook’s proprietary algorithms and software are essential to their domination of their respective aspects of the digital political economy. International IP laws, technoeconomic paradigms, sociotechnical imaginaries of development or norms of high-status consumption are also all power/knowledge technologies.

These complex assemblages (or dynamic ‘structures’) of power/knowledge relations and technologies are then co-produced, in interactive parallel, with strategic agency, including (everyday) practices and even the very subjectivities of agents themselves (Fig. 1). The systems are thus not just transformed or ‘transitioned’, but constituted and conducted through the constant cycling of this co-production of ‘structure’ and ‘agency’, where both are conceptualized as constitutively relational, dynamic and strategic.

As such, it is not that ‘power’ enters the picture only to ‘change’ a system already there and conceptualized as stable, nor that it is just a nefarious force responsible for lock-in to dysfunctional systems. Rather, the prior stabilization and emergence of that system in the first place is itself a matter of never-ending, ongoing, dynamic strategic jockeying. Moreover, in this perspective innovation emerges as a key process of this perpetual reconstitution and governing of these systems, as itself a power/knowledge process that we may call innovation-as-politics.

This is not the place to argue the advantages of this change in perspective in detail [14], [11], [15], [9]. In brief, though, reframed as systems of power/knowledge, analytical purchase is afforded on persistently problematic issues for MLP (and cognate) perspectives [16]. For instance, how can analysis illuminate system transition and potential trajectories for upscaling of existing ‘niches’ to the level of ‘regime’ discontinuity, and not just post hoc but prospectively and in real-time? Of course, this approach also places issues of power, politics and culture – likewise issues repeatedly noted as crucial gaps in the MLP (e.g. [17], [18], [19], [20], [21]) – at the very heart of theoretical understanding, not seeking to patch them in at a later stage.

More importantly for our purposes, this shift in perspective underpins each of the sets of insights that follow here. We start with the crucial one of reappraising what exactly (the challenge of) low-carbon transition is, and likewise for its corollary, low-carbon innovation. Conceptualized this way, it becomes clear that the challenge of low-carbon transition consists of transforming the power/knowledge relational ‘structure’, and the strategic agency/ies mediating and mediated by it, such that both are increasingly ‘sustainability-oriented’ (Cf [22]). Likewise, low-carbon innovation is primarily a power/knowledge process through which diverse power/knowledge technologies of system government are progressively made ecologically-attentive. In short, system transition is a process by and through which innovation-as-politics transforms not just the socio-technical furniture but the dynamic and mutually mediating phenomena – power/knowledge relations and technologies alongside subjectivities, identities and communities – that constitute given ‘societies’, including the dominant model of innovation itself.

Low-carbon innovation is thus primarily challenged with conjuring, cajoling and amassing the ‘power momentum’ [11] through which a new dynamic regime of (power/knowledge) system government may finally emerge: transition is a power/knowledge transition. And it is thus by exploring empirical evidence of specific low-carbon innovations displaying embryonic emergence of such power momentum, which may then be qualitatively but uncertainly extrapolated into ‘plausible’ [23] scenarios, that this approach affords insightful strategic foresight of real-time transitions (see [9]).

These abstract insights thus profoundly reframe transition studies in productive ways. But they are also illuminating regarding an analysis of the substantive characteristics of the contemporary predicament facing low-carbon transition in at least two key respects, regarding the abstract challenge (or ‘where we need to get to’) and the concrete predicament (or ‘from where’).

Regarding the former, low-carbon innovation is still too readily discussed in terms that presume the one-for-one and one-off replacement of existing ‘high-carbon’ technologies with better ‘green’ ones. It is clear, though, that low-carbon transition will not be (and cannot be) such a superficial technological substitution, leaving the substance of contemporary high-carbon ways of life as they are. Rather it must be an iterative and medium/long-term process of profound socio-technical change. Moreover, this process must itself prominently feature – and will be most effective and expeditious to the extent it consists of – profitable, competitive innovations, capable of both rapid adoption and cumulative growth of (power) momentum; all considerations strongly favouring DLCI[disruptive low-carbon innovation ], as already noted.

But a CPKS perspective illuminates this problematic further, allowing us to see that low-carbon transition is not a single ‘problem’ at all, not even a ‘system’ one. Rather it is merely one lens on a whole set of existential contemporary challenges – including for innovation itself – that simply cannot be analytically separated, let alone meaningfully addressed, in isolation, notwithstanding the ubiquitous attempts to do so.

For alongside climate change, there are not only the whole wider set of planetary boundaries [24], [25] and the socio-environmental challenges of the Anthropocene (e.g. [26]). But these are interwoven also with the emergence of cosmopolitized globalism (e.g. [27], [28]) and of new horizons of post- or trans-human innovation from massive networks of cheap interconnected learning machines (e.g. [29], [30]). As such, ‘low-carbon transition’ is simply the name for a much wider challenge for contemporary innovation-as-politics insofar as it is seen specifically through environmental glasses (and of anthropogenic climate change).

This wider challenge concerns a new global predicament of learning how to do the ‘complex government of complex systems’ well [9]. For each of these sub-challenges are different (and overlapping) manifestations of the inadequacy of current systems for the government of proliferating global complexity and inter-dependence. Such adept government of complexity, however, is mediated precisely by the prevailing relations and technologies of power/knowledge systems, demanding their iterative, incremental transformation and upgrading in real-time. And this reflexive transformation of power/knowledge relations is exactly what is meant by ‘innovation’(-as-politics). Contemporary innovation, including low-carbon, is thus primarily charged with transforming the processes and capacities for system governance that are capable of harnessing, rather than being overwhelmed by, proliferating complexity, ultimately towards the emergence of qualitatively new and productive dynamics at (global) system level.

As such, on the one hand, we can now specify that the goal of low-carbon transition is the emergence of such productive dynamics at system level for the ongoing and unending improvement and maintenance of resilient government of complexity, NOT a new and restabilized “post-transition” green socio-technical system. But, on the other, this also means that we must accept and embrace that there is no ‘there’ to which low-carbon transition is seeking to move, no specifiable or imaginable future (utopian?) end-state – and that (acknowledging) this irreducible future uncertainty is an essential element of constructing better futures, not an unfortunate or defeatist concession to reduced rational mastery. We thus need new dominant models of innovation that, like DI, are likewise adept at surfing rising waves of complexity and uncertainty – as crucial tools and resources of just such complex system government.

But this perspective also usefully illuminates the converse: the concrete, actual (meso-level) ‘here’ of these overlapping system failures and crises, the aspiration of escape from which is given the name ‘low-carbon transition’. This concerns the overarching crisis of the specific regime that is currently dominant at global scale, at the heart of which – being a power/knowledge system – is its particular model of power/knowledge government: the hegemonic model of neoliberal innovation(-as-politics). Neoliberalism is a regime of system government that has dominated global capitalism for some four decades. It is fundamentally oriented to expansion without limit of the rule of the market, which is conceptualized as the supreme decision-maker [31]. At its heart, in turn, is a specific model of innovation, focusing on highly proprietary, consumer and labour-substituting hi-tech with a view to maximized concentrated corporate control of all spheres of socio-economic life [32], [33], [34].

In recent years, as the ‘digital revolution’ has taken hold, this has mutated into a ‘late’ phase, in which internet giants have claimed the dominant models of innovation and corporate power [35]. This mutation of neoliberalism poses as its antithesis, emphasising its ‘open’ innovation credentials and free access to its services while carefully concealing the ways in which it depends upon a radical intensification of key neoliberal elements [36], [37], [38], [39], in a ‘Googliberalism’ [40].

In particular, these platforms enact a model of innovation that depends, more so even than archetypal neoliberal biotech, on growing speculative investment in its financialized assets [41], betting on the exponential growth of super-proprietary rents from monopoly control of markets for the exploitation of existing resources. Googliberal innovation is thus essentially parasitic and un-creative, intrinsically built upon the zero-sum Ponzi-like exploitation of current assets and resources, including the incumbent oil-based socio-technical system. It also thus divides societies ever more clearly into few spectacular winners – the asset-owning rentier, global, tax-dodging and increasingly politically-enabled elite – and a growing majority of system losers – a debt-laden, wage-stagnant, insecure and increasingly system-rejecting precariat – in mutual co-production to the former’s deepening personal advantage. Completing the cycle, then, winners pursue innovation that will further secure their advantage, not least through more Googliberal innovation, substituting productive, living-waged labour with cheap information technology. Googliberalism thus fundamentally underpins power/knowledge lock-in against system transition.

This characterization is necessarily far too brief. But it is sufficient to suggest how this dominant model of innovation-as-politics is a key dynamic in the power/knowledge government of the incumbent system, including its multiple overlapping and existentially-threatening crises [9]: Chs. 2&3. Yet it follows immediately that such innovation is not merely a different issue, comparatively irrelevant, to low-carbon transition – though it is hard to miss the terrible waste of ingenuity and finance currently invested in creating the next Killer App for some existing (if not environmentally problematic) consumption practice, rather than in tackling our planetary emergency. Rather, such innovation is in fact a key pillar of the problem. For it both actively discourages and obstructs significant low-carbon innovation while itself continually re-constructing and reproducing the high-carbon power/knowledge system and its extreme and worsening power asymmetries that we need to transcend. Furthermore, it follows that to the extent that we assent to the self-satisfied appropriation of the high-cachet label of ‘disruptive innovation’ (“the new rock and roll”, as the T-shirt declaims) by Silicon Valley Big Tech, we are also confusing the problem for the solution.

In short, then, a complex power/knowledge systems perspective alerts us to the siren song of Silicon Valley ‘disruptive innovation’, and spells out much more clearly even than socio-technical systems literature the nature and scale of the challenge for low-carbon innovation. To be of any relevance to low-carbon transition, in other words, what ‘disruptive innovation’ has to disrupt is innovation (-as-politics) itself.

3. The convergence of digital and disruptive innovation towards complexity capitalism

None of the foregoing should be mistaken, though, for arguing that digital innovation is irrelevant to disruptive low-carbon innovation, even as the issues are orthogonal and analytically distinguishable. To the contrary – and a development that is now categorically clearer than when discussions of DLCI began roughly a decade ago – digital innovation is key to the prospects of disruptive low-carbon innovation making a significant impact, in at least two ways. These go beyond reversing how digital innovation in its current dominant form is a key element of the problem, as just described. Rather, they concern the potentially seismic productive impacts as digital innovation comes to converge, first, with low-carbon transition per se; and then with disruptive low-carbon innovation specifically.

It must first be noted, though, that the advent of digital innovation is – per se not just in Googliberal form – a key element of the challenge, in terms of constructing complex government of complex systems. For, itself conceived as a power/knowledge process, digital innovation sits at a key node in the cycles of the contemporary capitalist system and its (currently overflowing, uncontrolled) proliferation of complexity (see Fig. 2, especially c). Digitization, and/or its flipside of informationalization, fundamentally consists of introducing a novel (i.e. ICT-based) mediation to processes of power/knowledge. For instance, manufacturing becomes mediated by software that, in turn, collects constant real-time data for further optimization; so too for information search, listening to music, ride-hailed journeys, even friendship. This novel mediation affords the reflexive and recursive measurement, transformation, interconnection and expansion of these power/knowledge processes at hitherto unprecedented rates and scales, while these digital innovations also thereby constantly and reflexively upgrade themselves – the very acme of the positive feedback loops constitutive of complex systems. In short, digital innovation is singularly productive of the problem-field of complex system government, even as it is generally evangelized as its panacea.

But there is no going back, no putting the digital genie back in the bottle or closing Pandora’s Box. The only way forward, thus, is to develop new models of digital innovation that can work with its capacity for proliferation of complexity but to more system-productive outcomes. In this respect alone, we can immediately see how a different (non-Googliberal) digital innovation necessarily must form a key element of any low-carbon transition. But conceived as a power/knowledge process, digital innovation also emerges as a clear, if as yet underexplored and seemingly tangential, aspect of low-carbon innovation itself.

This hinges precisely on how the digital is the would-be meta-mediator of all power/knowledge processes. For it follows not only that socio-environmental relations, technologies and practices (likewise conceptualized in power/knowledge terms) can be thus mediated, and thereby progressively transformed. But also that viewing any and every ecological problem-field in this way also immediately makes it (much more, if never perfectly or ‘correctly’, and indeed, likely problematically) amenable to capitalist ingenuity: pragmatically but avariciously exploring ways in which collation, mastery, ownership and possible construction of the relevant socio-environmental data – the ‘new oil’ [42] – can be of service to paying customers (and/or hopefully publics and state institutions) and hence profitable.2

In this way, then, the field of low-carbon innovation can be transformed from that of committed green pioneers worthily and laboriously constructing low(er)-carbon technologies, to a more generalized ‘greenrush’… with all that implies, both positive and negative. In other words, digital intermediation enables a process that harnesses the exceptional productivity (for good and/or ill − see conclusion) of capitalist innovation into a growing power momentum of low-carbon transition, and from here, in this late-neoliberal, unequivocally capitalist present.

Here the qualitatively tighter feedback loop of digital innovation (see Fig. 2c Cf b), as power/knowledge technologies reflexively upgrading themselves, also flips from problem to opportunity. While this dynamic is currently causing proliferating, untamed and destructive complexity, a digital greenrush would instead harness it into acceleration of productive innovation; and, indeed, a growing power momentum of sufficient heft that it can even break out of the profound current socio-technical system ‘carbon lock-in’ [43] (see Fig. 2d).

But what has any of this to do with disruptive low-carbon innovation? The answer is, everything, in that this (system-) productive, low-carbon, complexity-adept capitalism, this new harnessing of digital innovation to such productive effect, is entirely dependent upon the latter’s convergence with disruptive innovation. Regarding the productivity and results of innovation, the convergence of disruptive and digital innovation – now just beginning, as both ‘disruptive digital innovation’ and ‘digitized disruptive innovation’ – promises to effect an exponential boost in the significance of both, including for low-carbon transition.

On the one hand, digital innovation adds a quantum boost to disruptive innovation. DLCI is already per se enabled – by its targeting of massive ready demand for low-cost but novel functionalities – to provide fast-growing goods and services disruptive of existing modes of practice. But combining this with digital innovation compounds this dynamism. This is not just because it furnishes disruptive innovation with a whole new momentum, drawing on both the digitized opening up of innovation (if not quite or necessarily its ‘democratisation’) and the dynamic of ‘exponential technology’ described (and mistakenly conflated as ‘disruptive innovation’) by Silicon Valley futurist gurus [44] – though these factors undoubtedly matter, and show how (a future) Silicon Valley could yet be a significant part of the transition, not just the problem. But also because, where environmental innovation is increasingly mediated by digitization and datafication, these processes and projects of innovation are opened up to productive capitalist exploration and exploitation, as described above, thoroughly transforming the prospects and momentum of such innovation. Low-carbon innovation, in short, is productively reframed as primarily a challenge not of emissions and energy but of data and complexity and its harnessing for productive system government. This thereby transforms low-carbon transition from expensive problem dependent on ethical vision and political will to a strategic opportunity for business.

Moreover, in classic complex system positive feedback loops, this does not just apply to individual low-carbon ventures, but promises to transform the broader taskscape and possibility space of low-carbon innovation per se. For both the greater hubbub of innovation activity generated by the combination of digital and disruptive (low-carbon) innovation, across a wide range of issues, and the nature of the disruptive innovation model itself – adept precisely at working rapidly, flexibly and resiliently with and within complex, uncertain and shifting milieux – combine to create a situation in which combinations of disruptive innovations (or recombinations of recombinations) are not just likely, but actively and relentlessly sought out.

In this context, then, it is also likely that the investment climate and innovation zeitgeist would change. Finance would no longer focus on unicorns, pursuing the ‘next Uber’ (of cooked meals, DIY tools or whatever…) that promises sure-fire returns for maximally monopolized exploitation of existing assets. Instead, the game would become one of risky competitive investing in the disruptive innovation that best promises to be a pivotal (but maybe not ‘central’) node in an as-yet-nonexistent and irreducibly uncertain but credible future networked assemblage of firms and customers – where disruption of existing systems of provision in some form is the base common-sense.

Interlocking with other still-to-be-developed innovations, then, these disruptive digital innovations will altogether mediate, and so govern anew, crucial complex processes of global socio-environmental metabolism. And with disruptive low-carbon innovation now ‘speaking the same language’ (i.e. of data and its ICT intermediation) as digital innovation, there is a new bridge and lubricant for cross-fertilization. In this way, too, innovation can be imagined (if, of course, not guaranteed) that is progressively more capable of dealing with socio-environmental challenges in all their geographical specificity, complication and complexity, not just proffering an (entirely unrealistic and strategically self-defeating) one-size-fits-all ‘green technology’ future. And this is especially the case since this is disruptive innovation-as-politics, meaning that these disruptive digital low-carbon innovations will very likely be profoundly contested and thereby made into effective power/knowledge technologies of system government (e.g. see Table 1, below).

In short, then, digital disruptive innovation allows at least the conceptualization of a transformed capitalism, in the medium-term, in which crystallizing clusters of actual system transition are increasingly observable and so themselves become the focus of competitive innovation and investment. In other words, if DI (and DLCI) to date has already shown promise working on ‘real world’ socio-technologies, as it comes to be combined with and mediated through digitization it could well become revolutionary – or, rather, ‘transformational’ (Cf [46]).

On the other hand, disruptive innovation reciprocally transforms digital innovation. In particular, disruptive innovation offers a model of low-cost, hence capital-substituting, and labour-creating innovation capable of harnessing digital innovation to productive ends (regarding new commodities/services, sectors and even systems), not merely parasitic, exploitative and labour-destroying ones. Consider, for instance, disruptive innovation regarding low-cost heart surgery in India [47] or solar water heaters in China [48], [49]. A DI model thus enables digital innovation to reap parallel transformation of the ‘structure’ of power/knowledge relations such that it can begin to match, keep up with and newly regulate the transformations it is already driving in agency, practices and power/knowledge technologies (Fig. 2d).

As such, disruptive (and disrupted, post-Googliberal) digital innovation(as-politics) can indeed become the key element of low-carbon transition mentioned above; constantly, dynamically and cumulatively transforming both power/knowledge relations and technologies towards marshalling the necessary power momentum for a new complexity-adept capitalism (in the first instance) that can avert climate catastrophe in the next few decades.

#### Narrowing Parker immunity empowers the FTC to challenge anticompetitive business sanctioned by state regulatory schemes

Crane 19 [Daniel A. Crane, Frederick Paul Furth Sr. Professor of Law, University of Michigan, 60 Wm. & Mary L. Rev. 1175, 2019, Lexis]

INTRODUCTION

This Article's intended audience holds a common view that state and local governments frequently adopt anticompetitive regulations for the benefit of economic special interests and that these acts of cronyism are pernicious to democracy, consumers, and economic efficiency. 1 In other words, the costs to society of these regulations far outweigh any reasonable benefits. A wise, beneficent, and all-knowing Platonic guardian of the state would have little trouble in striking down such regulations.

A further point of general consensus might relate to the particularly pernicious effect of anticompetitive state and local regulation in stifling new production innovation. In a variety of ways, our constitutional order is stodgy. Its conservatism lends a hand to the beneficiaries of incumbent technologies as they seek to deploy state power to block or to slow the advent of new technologies that may eventually displace the old, thereby preventing a realignment of wealth and position. In recent years, innovative technologies developed by companies such as Tesla, Uber, Lyft, and Airbnb have encountered determined opposition from purveyors of predecessor technologies, who have often used state and local regulation to thwart innovation. 2

So much for the common ground. Where consensus quickly fragments is on the question of what, if anything, to do about such regulations given that wise, beneficent, and all-knowing Platonic guardians of the state are in short supply. In the imperfect messiness that is liberal democracy, we frequently accept a host of comparatively petty inconveniences--political and economic--in order to preserve larger values. Just as we tolerate many market failures because the attempt at a regulatory fix might aggravate matters, we may have to tolerate some political failures on the same grounds.

[\*1178] Much of the difficulty has to do with the fact that while there might be a broad consensus that state and local governments enact many unjustifiable anticompetitive regulations, there is not a clear consensus on which ones they are. The experience with economic substantive due process in the late nineteenth and early twentieth centuries, epitomized in Lochner v. New York, 3 has left the American political psyche gun-shy about permitting judges to strike down protectionist economic regulations on constitutional grounds. Shortly after getting out of the Lochner business, the Supreme Court announced that it would not get into the same business under the guise of the antitrust laws. 4 Over time, the development of the Parker state action doctrine allowed the courts to play a somewhat expanded role with respect to anticompetitive state and local regulations, but the zone of judicial review remains relatively constricted. 5

The purpose of this Article is to compare the deployment of constitutional and antitrust tools to scrutinize potentially anticompetitive state and local regulations against the backdrop of the ubiquitous concern about "Lochnerizing" under the auspices of either constitutional or statutory authority. Here is the question in a nutshell: If one believes that courts (or perhaps federal administrative agencies) should do somewhat more than they currently do to scrutinize and potentially invalidate anticompetitive state and local regulations, which lever should they pull--constitutional doctrines, antitrust preemption, or both? Because there are some overlapping, and some separate, institutional constraints and potential pathologies between constitutional and antitrust law, it is important to compare the two tools before deploying them.

This Article is organized as follows: Part I diagnoses the underlying features of democratic government that produce anticompetitive regulation. Some of this story is quite familiar, but I present some new observations with respect to the role of technological incumbency as a strong factor in invoking regulation to thwart innovation.

[\*1179] Part II explores the historical, ideological, and institutional foundations of the current legal doctrines with respect to constitutional and antitrust scrutiny of anticompetitive regulations. It shows that, despite the narrowing of Parker immunity in recent decades and some recent revival of equal protection and substantive due process as constraints on anticompetitive regulation, a good deal of anticompetitive state and local regulation remains impervious to legal challenge.

Part III compares the potential efficacy and pitfalls of deploying constitutional or antitrust doctrines as checks on anticompetitive state and local regulations. It considers: (1) the reach and domain of constitutional and antitrust theories; (2) the ways in which each theory could accommodate genuine and sufficient justifications for the challenged regulations; (3) ways in which the antitrust and constitutional tools differ substantively and procedurally; and (4) ways in which the two theories might interact.

I. WHY ANTICOMPETITIVE REGULATION SUCCEEDS

This Article opened with the assumption that a wide universe of unjustified state and local anticompetitive regulation exists that a benevolent Platonic guardian of the state would instantly nullify. Given this conceit, the presence of such regulations necessarily represents democratic failures, as democracy should, in principle, strive for laws that confer positive, rather than negative, public benefit. What, then, accounts for the pervasive existence of these undesirable regulations? The answer comes in two parts--a generic (and largely familiar) story concerning anticompetitive regulations as a whole, and a more specific story concerning the battle between incumbent and innovative technologies.

A. The Generic Story

The generic story is largely familiar from public choice theory and the literature on the Parker state action doctrine. Democratic processes systematically fail to overcome two embedded hurdles to matching regulatory schemes to broad public preferences: (1) the asymmetrical distribution of costs and benefits of anticompetitive [\*1180] regulations, and (2) the externalization of costs on populations outside the boundaries of the relevant democratic unit. 6 In tandem, these hurdles to democratic correction of cronyistic dispensations of monopoly power by governmental regulators perpetuate regulatory schemes that a broad majority of citizens would vote to overturn if they understood the issue and were sufficiently motivated to invest political energy in correcting it. 7 The first democratic deficit, well documented in public choice literature, arises because producers typically receive a much more concentrated benefit from anticompetitive regulations in comparison to the relatively unconcentrated cost imposed on consumers. 8 A small band of producers may lobby aggressively to enact or maintain an anticompetitive scheme that permits the producers to collect significant monopoly rents. 9 Those rents, in turn, may be spread across thousands or millions of consumers, each one paying a relatively small increase in rent. 10 Collective action constraints--the cost of mobilizing consumer sentiment and action to oppose the regulation--give the producers a systematic advantage in maintaining the regulation. 11 As John Shepard Wiley explained in bringing public choice theory literature to bear on Parker immunity questions: [I]f the group [of consumers] is large, individual members have little incentive to participate because participation is personally costly and contributes little to the group's chances for successful joint action. Small groups encounter fewer of such problems. If group members behave in this rational self-interested manner, then "there is a systematic tendency for exploitation of the great by the small"; less numerous, more intensely concerned special [\*1181] interests can predictably outmatch more numerous, more mildly concerned consumer or "public" interests in legislative or regulatory fora--even though the actions of special interests impose a net loss on society. 12 The second deficit arises when governmental units--whether state or local--externalize the costs of the anticompetitive regulation outside their jurisdiction. The classic example is Parker itself, in which 90 percent of the raisins subject to California's agricultural cartel mandate were sold outside of California. 13 Out-of-state consumers could not be counted on to mobilize democratically to oppose the California regulation, as they had no political voice in California. 14 Many similar examples of jurisdictional cost externalization have been documented. 15 One arose in an important Supreme Court decision on state action immunity, Town of Hallie v. City of Eau Claire. 16 Hallie, Seymour, Union, and Washington were unincorporated towns adjacent to the city of Eau Claire, Wisconsin. 17 Their citizens could not vote in Eau Claire, but Eau Claire wanted to annex those territories into its boundaries, possibly through coercive means. 18 Eau Claire received federal funds to build a sewage treatment plant in its service area, which covered the four towns, then refused to supply sewage treatment services to the towns. 19 However, the city did agree to provide treatment services to certain homeowners in the towns if a majority of area voters voted by referendum to allow Eau Claire to annex their homes and to commit to use Eau Claire's sewage and transportation services. 20 The towns claimed this scheme was designed to keep the other towns from effectively competing with Eau Claire's sewage collection and transportation services. 21 The scheme also possibly allowed the [\*1182] city to raise costs for nonresidents while at the same time leveraging the higher prices to bring the nonresidents (and presumably their property taxes) into the city. 22 Although the city's motivation was ultimately political rather than narrowly economic, it used an anticompetitive strategy to dump monopoly costs on nonresidents who could not vote to rescind the regulations until they joined the city, at which point the question would be moot. 23 Together, these two deficits--asymmetrical costs and benefits to both producers and consumers and cost externalization--explain why democratic processes often fail to weed out anticompetitive regulations. Without concerted efforts by champions of consumer interests to overcome collective action problems and mobilize support for regulatory reform, the regulatory barriers to competition can linger indefinitely. As discussed next, these failures of democratic self-correction are exacerbated by regulations that entrench incumbent technologies at the expense of innovation.

B. Additional Considerations Affecting Product Market Innovation

Many of the contemporary regulatory battles between old and new technologies (particularly those involving the sharing economy) can be understood as follows. The incumbent regulatory scheme arose many decades ago and may well have been legitimately justified (in the sense of not imposing more costs than benefits) at the time of its adoption. 24 Our hypothesized Platonic guardian might even have approved of it at the time of its adoption. 25 The passage of time and advent of new technologies has now eroded the original basis of the regulation, and our Platonic guardian would therefore want the regulation rescinded or reformed. However, incumbent firms succeed in blocking or slowing innovative competition by circling the wagons around the incumbent regulatory schemes. 26 In [\*1183] these wars, the incumbents have a decisive advantage for at least three structural reasons.

First, if the incumbent regulatory scheme has allowed the incumbent firms to collect monopoly rents, then there may be a sharp asymmetry of incentives between old and new firms. 27 This is the same asymmetry that attends any struggle between incumbent monopolists and new competitive entrants: the monopolist is seeking to protect a large market share at a monopoly price, whereas the new entrant can only hope to gain a smaller market share at a competitive price. 28 Because the incumbent has more to gain than the new entrant has to lose, the incumbent will be willing to spend more to entrench the regulatory monopoly than the new entrant will be to challenge it. 29 This, in turn, discourages potential new entrants from investing in innovative new technologies and mounting political and market-oriented challenges to the incumbents. 30

Second, the incumbents have the advantage of status quo biases and fears about the consequences of technological change. 31 Costs of the existing system--to human safety, for example--may be seen as an inevitable baseline, whereas potential risks from the new technology may be seen as incremental threats. 32 Hence, risks and costs of the existing system may be undercounted or not counted at all, while risks and costs of the new system will be made to bear the full weight of their risks and costs.

For example, in recent months there have been widely reported stories of Uber drivers sexually abusing passengers. 33 These stories rarely report the base rate of abuse by taxi drivers or public transit [\*1184] workers, who might well present similar risks to passengers. 34 Similarly, the news media seem to wait with bated breath to report every accident involving a driverless vehicle 35 --even ones where the vehicle was stationary and hit by another at-fault vehicle--without reporting the base rate of nearly 40,000 deaths a year from human-driven vehicles. 36 The focus of news reporting seems to be on the incremental risks created by automated driving without regard to the baseline number of deaths that automated driving might diminish. 37 In principle, regulators should compare the likely risks of allowing new technologies to those of perpetuating the incumbent technology, but they often default to some version of the precautionary principle, insisting that new technologies prove their safety and efficacy in an absolute rather than comparative sense. 38 Given this baseline asymmetry, proponents of new technologies frequently must overcome significant regulatory hurdles not faced by incumbent technologies. Or, incumbent technologies may persuade regulators to force new technologies to play by rules that favor the incumbent technologies--a form of raising rivals' costs and creating regulatory entry barriers. 39

Finally, incumbents enjoy the generic benefits of incumbency in a structurally conservative constitutional and political system. The multiple "veto gates" to reform legislation--structural factors such as bicameralism, presentment, filibusters, and committee structures 40 --empower technological incumbents to ride the status quo for years or decades after our hypothetical Platonic guardian would have instituted public-minded reforms. 41

[\*1185] In combination, these three factors create additional barriers to the expected flow of democratic processes toward majoritarian equilibria--that is to say, equilibria that favor consumers' interests in competition and innovation over those of producers in capturing monopoly rents. In light of these factors and the collective action and cost externalization factors discussed earlier, 42 it is unsurprising that regulation serves as a barrier to innovation.

C. An Illustration from Automobile Distribution

The ongoing story of Tesla's efforts to break into the American automobile market illustrates the stickiness of incumbent regulations. 43 For a variety of business reasons, when Tesla entered the market in 2012, it decided that it would have to sell its all-electric vehicles (EVs) directly to consumers, meaning that it would have to open its own showrooms and service centers rather than outsourcing that function to franchised dealers. 44 Among other things, Tesla believed that traditional dealerships would be reluctant and ill-positioned to sell EVs and that Tesla therefore could not expect to convince already skeptical customers to buy EVs unless it opened its own retail facilities. 45 Since the mid-twentieth century, however, most states have adopted laws intended to protect dealers from unfair exploitation by manufacturers. 46 Among the provisions in many of these state statutes is a prohibition on a manufacturer opening its own showrooms and service centers. 47 In many states, manufacturers are required to distribute through independent dealers only. 48

Legislatures adopted these direct distribution prohibitions at a time when American car manufacturing was dominated by the "Big Three" (Chrysler, Ford, and General Motors) and many dealers were [\*1186] "mom and pop" businesses. 49 State legislatures were convinced that the dominant manufacturers were taking advantage of their franchisees by selling cars through their company-owned stores at lower prices than the dealers could afford to charge given the wholesale prices charged by the manufacturers. 50 The direct distribution prohibitions were justified as correcting a severe imbalance in bargaining power leading to contracts of adhesion and unfair exploitation in manufacturer-dealer relations. 51

Assuming that dealer protection rationale made sense in circa 1950, its basis has almost entirely vanished today. With the advent of competition from Europe and Asia, the Big Three are no longer dominant. 52 Dealers have many choices of automobile franchisors and hence considerably more power in negotiations over franchise terms. Further, the dealers are no longer mostly mom and pops. 53 Rather, most dealers are organized into multi-dealer groups, many with hundreds of millions or billions of dollars in annual revenue. 54 Indeed, some of the largest dealer groups have more annual revenue than Tesla. 55 Most significantly, the dealer protection rationale has nothing to do with a company such as Tesla that does not seek to distribute through dealers at all. 56 No dealers, no dealer exploitation.

Recognizing that the dealer protection rationale that justified the original statutes no longer works, the dealers have attempted to recast the direct distribution prohibitions as consumer protection decisions. 57 They have argued that forcing consumers to buy automobiles from dealers rather than from manufacturers will lead to more price competition, and hence lower prices, and prevent [\*1187] consumers from manufacturer exploitation. 58 These consumer protection arguments have been roundly rejected by economists, 59 the Federal Trade Commission (FTC), 60 and major proconsumer groups such as the Consumer Federation of America, Consumer Action, Consumers for Automobile Reliability and Safety, and the American Antitrust Institute. 61 Nonetheless, the dealers have succeeded in using the existing structure of dealer protection laws to block or slow Tesla's direct distribution program in a number of states. 62

The Tesla story evidences most of the factors that contribute to the persistence of anticompetitive regulations. The dealers have a concentrated interest in preserving their protected position, while the costs of that protectionism are spread out over millions of consumers. In the state with arguably the most pernicious record with respect to direct distribution reform--Michigan--there is a record of antireform advocacy by a leading incumbent--General Motors--and acquiescence by the political class to protect an in-state champion against an out-of-state challenger. 63 Even though consumers complain more about car dealers than about any other business, indicating the baseline system is not particularly attractive to them, 64 the dealers have invoked fears about the risks of direct distribution in opposition to legislative reforms. And legislative [\*1188] inertia has slowed the consideration of reform bills in some states, extending the incumbent regulatory scheme long past its reasonable expiration date. 65

The structural factors weighing against proconsumer and pro-innovation reforms will not block Tesla forever. The company has already seen significant successes in some state legislatures and courts and is progressively penetrating the market. 66 Yet it would be misguided to consider the company's eventual success a reason not to worry about the structural factors entrenching anticompetitive regulations, especially those foreclosing innovation. No monopoly is permanent--even the most persistent are eventually eroded. 67 Innovative technologies will almost always find a way out eventually, despite incumbent machinations. 68 What incumbents can buy is not monopoly in perpetuity but in extension. 69 Those years or decades of extension are costly to society. They represent significant overcharges to consumers, misallocations of social resources and, in the extreme, impairment to health and safety-- even lives lost. 70

Not every instance of anticompetitive state or local regulation exhibits the full set of explanatory factors discussed in this Article as cleanly as the ongoing Tesla saga does. Yet the Tesla story is more paradigmatic than idiosyncratic. Across the economy, incumbent technologies are structurally advantaged to deploy regulatory forces to stifle or slow innovation.

[\*1189] II. CONSTITUTIONAL AND ANTITRUST PRINCIPLES AS A CHECK ON ANTICOMPETITIVE REGULATION

If democratic processes fail to check anticompetitive state and local regulations on a systematic basis, then what can be done about it? Among the potential tools are institutional efforts to address the quality of legislation and regulation through democratic processes, such as creating governmental competition advocacy bodies within state and local governments or using federal purse strings to incentivize state and local governments to reevaluate their regulations. These democratic options are important, but they often fall prey to the pathologies of democratic decision making identified earlier. 71 Competition advocates--whether in government or in the private sector--often face formidable structural barriers to advancing the procompetition interest: entrenched incumbent monopolies, difficulties in mobilizing consumer support given the often diffuse nature of consumer harm, and institutional biases against change. 72

In addition to the democratic options, there are what could be styled counterdemocratic possibilities, insofar as they involve the use of courts or agencies to strike down anticompetitive statutes and regulations as inconsistent with some overarching norm of federal law, whether statutory or constitutional. 73 These counterdemocratic possibilities often do not run into the same structural status quo biases as the democratic possibilities do. For example, advocates of a legal theory for overruling an anticompetitive state or local regulation do not have to mobilize broad political support for their position or surmount the "veto gates" 74 built into ordinary political processes. Rather, they typically only have to persuade a small set of elite decision makers that their position is legally correct. It is with these counter-democratic possibilities that this Article is primarily interested.

[\*1190] The counterdemocratic or countermajoritarian quality of these deployments of judicial review is what places their use in some doubt, 75 even granting the assumption that they are targeting objectively undesirable regulations. 76 In the arc of American history, the courts have vacillated in their willingness to engage in such judicial review since the mid-twentieth century. Late nineteenth and early twentieth century courts were willing to engage in broad judicial review of economic regulation, 77 but the tide turned strongly against such review in the mid-twentieth century. 78 Only in recent years have glimmers of a return to some form of strong judicial review of anticompetitive regulations made a reappearance. 79

A. Lochner, anti-Lochner, and Parker

The stage for the current constellation of judicial doctrines and attitudes towards federal judicial review of anticompetitive state and local regulations was set through the progression of Lochner-era substantive due process, the anti-Lochner constitutional revolution of 1937, and the extension of anti-Lochner sentiment to federal antitrust law in the creation of Parker's state action immunity doctrine in 1943. 80 In 1905, the Supreme Court in Lochner struck down a New York law regulating bakeshop working hours on substantive due process grounds, 81 over Justice Oliver Wendell Holmes's famous objection that "[t]he Fourteenth Amendment does not enact Mr. Herbert Spencer's Social Statics." 82 During the Progressive and New Deal eras, Lochner and Lochnerism were broadly vilified for interfering with progressive reforms and substituting judges' economic views for those of legislatures. 83 In the New Deal constitutional revolution associated with the year 1937 (although spanning a few years in either direction), the Supreme [\*1191] Court announced it was getting out of the Lochner business--that it would not strike down economic legislation simply on the grounds that it was, in the judgment of the court, ill-considered. 84 Over time, it became clear that the anti-Lochner jurisprudence extended to nakedly anticompetitive regulations adopted to favor economic special interests to the detriment of the consuming public. In cases such as Williamson v. Lee Optical 85 and Ferguson v. Skrupa, 86 there was a fairly apparent record that the regulations in question had been adopted to stifle competition and benefit economic special interests, but the courts refused to create an exception to the anti-Lochner doctrine on those grounds. 87 In Williamson, the Court acknowledged that the "Oklahoma law may exact a needless, wasteful requirement in many cases," but insisted that the "day is gone when this Court uses the Due Process Clause of the Fourteenth Amendment to strike down state laws, regulatory of business and industrial conditions, because they may be unwise, improvident, or out of harmony with a particular school of thought." 88 Rather, the Court held that "[f]or protection against abuses by legislatures the people must resort to the polls, not to the courts." 89 In 1943, the Supreme Court in Parker v. Brown also made clear that it would not permit the federal Sherman Act to be used as an end-run around the anti-Lochner cases. 90 Parker involved both dormant commerce clause and Sherman Act challenges to California's Agricultural Prorate Act, which forced farmers into a marketing plan that effectively operated as an output reduction cartel run by farmers. 91 The Supreme Court rejected both challenges. 92 Finding "nothing in the language of the Sherman Act or in its history which suggests that its purpose was to restrain a state or its officers or agents from activities directed by its legislature," 93 the Court created a doctrine of state action immunity for anticompetitive state [\*1192] and local laws. 94 The effect of this ruling was to restrict the Sherman Act's coverage solely to purely private conduct. 95 Anticompetitive schemes orchestrated by the state would be excluded from judicial review. 96 As Judge Merrick Garland has observed, Parker is best understood as a continuation of the post-1937 jurisprudence rejecting Lochner: Parker v. Brown was much less a case about judicial faith in economic regulation than it was a case about judicial respect for the political process. Parker was indeed a child of its times, but the most salient element of that historical context was the Court's recent rejection of the Lochner-era doctrine of substantive due process, under which federal courts struck down economic regulations they viewed as unreasonably interfering with the liberty of contract. Having only just determined not to use the Constitution in that manner, the Court was not about to resurrect Lochner in the garb of the Sherman Act. 97

B. The Potential for an Increased Level of Judicial Scrutiny

As of 1943, one would have been justified in believing that, at least from the perspective of federal judicial review, anticompetitive state and local regulations would receive a free pass unless they [\*1193] committed certain egregious violations, such as disadvantaging "discrete and insular minorities" 98 or discriminating against out-of-state commerce. 99 But the judicial impulse to cast a stern glance at perniciously anticompetitive regulations could not be forever stifled, and before long cracks began to appear in the courts' anti-Lochnerian resolve.

Antitrust law and its state action immunity doctrine were the first to move in a significantly more interventionist direction. By the time of the Midcal decision, the state action immunity doctrine had been narrowed to permit judicial scrutiny unless the state regulation met a two-part test: (1) clear and affirmative expression of the anticompetitive policy by the sovereign state itself, and (2) active supervision of the policy's implementation by state actors. 100 Under this structure, the courts have invalidated a number of anticompetitive state regulatory schemes--most recently the practice of delegating regulatory power to occupational licensing boards staffed with potentially self-interested industry participants. 101

The Midcal test invokes a democracy-reinforcement theory of antitrust judicial review. 102 States may enact anticompetitive regulations so long as they take conspicuous responsibility for them. 103 If the state can be obviously identified with the scheme, then perhaps citizens will "vote out the bums" if the costs to consumers are too high. 104 Alas, many anticompetitive regulations escape Midcal's net because of the systemic factors identified in the previous section. 105 Even when a state conspicuously takes ownership of an anticompetitive scheme, democratic processes may fail to provide a remedy because of the asymmetry of costs and benefits [\*1194] between producers and consumers, the externalization of costs outside the voting jurisdiction, and the entrenched advantage of technological incumbency. 106

In light of the limited efficacy of Midcal's regime, one could consider additional ways to increase the level of antitrust scrutiny of anticompetitive state and local regulations. Commentators have proposed various such doctrinal approaches to invigorate antitrust preemption. For example, courts might adopt a cost-externalization test, which would invalidate regulatory schemes that externalize a disproportionate share of monopoly overcharges outside the boundaries of the political district enacting the regulation. 107 Or, as I have proposed elsewhere, they might read the Parker doctrine as entirely inapplicable to enforcement actions by the FTC--a legal question that the Supreme Court has held is still open. 108 In the event that the courts hold Parker inapplicable to the FTC, the Commission might play a significantly enhanced role in checking anticompetitive abuses by state and local governments.

Despite calls for a broader use of federal antitrust law to police anticompetitive state and local regulations, the Supreme Court continues to refine the Parker doctrine with an eye on Lochner. Then-Justice Rehnquist once worried that the Court should not "engage in the same wide-ranging, essentially standardless inquiry into the reasonableness of local regulation that th[e] Court … properly rejected" in terminating Lochnerism. 109 In his dissenting opinion in Community Communications Co. v. City of Boulder, Justice [\*1195] Rehnquist warned about the risks of opening up antitrust review of municipal regulations in a way that would require cities to justify their regulations, and the courts, in turn, to weigh those justifications. 110 Rehnquist wrote:

If the Rule of Reason were "modified" to permit a municipality to defend its regulation on the basis that its benefits to the community outweigh its anticompetitive effects, the courts will be called upon to review social legislation in a manner reminiscent of the Lochner era. Once again, the federal courts will be called upon to engage in the same wide-ranging, essentially standardless inquiry into the reasonableness of local regulation that this Court has properly rejected. Instead of "liberty of contract" and "substantive due process," the procompetitive principles of the Sherman Act will be the governing standard by which the reasonableness of all local regulation will be determined. Neither the Due Process Clause nor the Sherman Act authorizes federal courts to invalidate local regulation of the economy simply upon opining that the municipality has acted unwisely. The Sherman Act should not be deemed to authorize federal courts to "substitute their social and economic beliefs for the judgment of legislative bodies, who are elected to pass laws." The federal courts have not been appointed by the Sherman Act to sit as a "superlegislature to weigh the wisdom of legislation." 111

Also in the shadow of Lochner, recent years have shown glimmers of a reinvigoration of constitutional doctrines checking anticompetitive abuses by state and local governments. The negative or dormant commerce clause--limited by the Parker Court on anti-Lochner grounds--has occasionally been deployed to invalidate not only anticompetitive regulatory schemes 112 that discriminated against out-of-state interests, but also, on occasion, those that impose significant burdens on interstate commerce without a sufficient justification. 113 As of this writing, Tesla is testing the limits of these [\*1196] doctrines in its challenge to Michigan's direct distribution law. 114 Its complaint for injunctive relief asserts:

[Michigan's] [p]articularly egregious protectionist legislation … blocks Tesla from pursuing legitimate business activities and subjects it to arbitrary and unreasonable regulation in violation of the Due Process Clause of the Fourteenth Amendment; subjects Tesla to arbitrary and unreasonable classifications in violation of the Equal Protection Clause of the Fourteenth Amendment; and discriminates against interstate commerce and restricts the free flow of goods between states in violation of the dormant Commerce Clause. 115

Thus far, Tesla has survived a motion to dismiss in federal court and won a key discovery motion seeking automobile dealers' communications concerning the Michigan ban on direct distribution. 116

Perhaps even more significant have been a handful of court of appeals decisions applying equal protection principles to invalidate anticompetitive regulations designed solely to protect a discrete group of economic actors from competition--although there remains a circuit split over this practice. Morbidly, the most significant cases have all been related to funeral parlors and casket sales.

In 2004, the Tenth Circuit in Powers v. Harris rejected a constitutional challenge to an Oklahoma statute that limited casket sales to licensed funeral parlors. 117 The court accepted the premise that the statute had no genuine health and safety rationale and was "a classic piece of special interest legislation designed to extract monopoly rents from consumers' pockets and funnel them into the coffers of a small but politically influential group of business people--namely, Oklahoma funeral directors." 118 Nonetheless, the court held its hands were tied by the anti-Lochner cases--particularly [\*1197] Williamson and Ferguson, which also involved (arguably) nakedly parochial anticompetitive regulations. 119

On the other hand, in their own casket cases, the Fifth and Sixth Circuits invalidated the anticompetitive schemes on equal protection grounds, holding that "protecting a discrete interest group from economic competition is not a legitimate governmental purpose" and therefore fails even rational basis review. 120 This exercise of what Judge Ginsburg calls "rational basis with economic bite" could grow into a significant check on anticompetitive state and local regulation if utilized more expansively. 121 If this Article's premise is valid--that regulations designed solely to protect "discrete interest group[s] from economic competition" 122 are pervasive--then the federal courts have their work cut out for them if they take up the casket maxim with seriousness.

However, it is far from certain that they will or should. Despite the movement towards enhanced scrutiny of anticompetitive economic cronyism just described, the ghosts of Lochner continue to loom large. Even judges unsympathetic to the casket regulations may be concerned about the prospect of unelected judges substituting their own economic preferences for those of democratically elected representatives. In Powers, the Tenth Circuit listed a series of classically anti-Lochner rationales (including a rejection of the role of the Platonic guardian hypothesized in this Article) for refusing to embrace the Sixth Circuit's antiparochialism principle:

First, in practical terms, we would ~~paralyze~~ state governments if we undertook a probing review of each of their actions, constantly asking them to "try again." Second, even if we assumed such an exalted role, it would be nothing more than substituting our view of the public good or the general welfare for that chosen by the states. As a creature of politics, the definition of the public good changes with the political winds. There simply is no constitutional or Platonic form against which [\*1198] we can (or could) judge the wisdom of economic regulation. Third, these admonitions ring especially true when we are reviewing the regulatory actions of states, who, in our federal system, merit great respect as separate sovereigns. 123

So here is the question for those who accept this Article's central premise regarding the prevalence of anticompetitive state and local regulation and yet worry, like the Powers court, about a return to Lochner: If one is interested in pulling additional judicial levers to scrutinize anticompetitive state and local regulations, but worried about returning to Lochnernism, how do the constitutional and antitrust levers compare? Are both equally susceptible to misuse and abuse, is one less risky than the other, and are there limits that could be placed on both to cabin their potential risks? This Article's final Part compares the constitutional and antitrust tools as potential foils to anticompetitive state and local regulation to help answer these questions.

III. COMPARING THE RISKS AND LIMITS OF THE CONSTITUTIONAL AND ANTITRUST TOOLS

A. Limiting the Scope of Judicial Review to Regulations Affecting Competition

The fear of a return to Lochnerism is in large part a fear that judicial review of economic regulatory decisions is a Pandora's box that, once open, would quickly unleash a full-scale movement toward a substitution of judicial economic philosophies for those of the democratically responsive branches. 124 Hence, in the current constellation of Lochner-phobia, it is important to explain how any doctrine that invites increased judicial scrutiny of economic regulation would be cabined or restrained by a workable limitation principle. Both the antitrust and constitutional tools under consideration embody such a limitation principle insofar as they do not propose universal federal scrutiny of all undesirable state economic regulation. Instead, they limit the scrutiny to regulations that harm [\*1199] competition for the benefit of identifiable special interests. In other words, the prima facie case in either event requires demonstration of competitive harm as opposed to merely social undesirability. 125 The "competitive harm" limitation principle excludes from judicial review a wide set of regulations and hence limits the range of judicial interference with state regulatory schemes. Many cronyist regulations line the pockets of politically connected special interests without necessarily impairing competition. Consider, for example, a city ordinance that required disposal of a certain kind of medical waste at a pharmacy. Assume further that the waste in question could be safely disposed of through ordinary garbage collection, and the sole purpose of the scheme in question was to provide pharmacies with an opportunity to charge a fee for collecting the waste. Our hypothesized Platonic guardian would wish to overturn that regulation but could not do so on the constitutional or antitrust grounds under consideration because the regulation in question does not limit competition in any important sense. Rather than stifling competition in a legitimate market, it creates a new market for an undesired and unnecessary service. Lochner-phobes may wonder whether this limitation principle is limited enough. Although the limitation carves off a large swath of cronyist regulations from review, it still includes a relatively large universe of regulations, creating the possibility that judges will have a free hand to strike down many important state regulatory programs in the name of enhanced competition. Those less worried about Lochner and more willing to encourage judicial review of economic regulation may worry that the limitation principle is too limited and that it would allow a vast universe of cronyist regulation to escape judicial scrutiny on the same grounds that much cutthroat business behavior escapes antitrust scrutiny today--it may be unethical or undesirable, but does not fall within the purview of the antitrust laws because it does not impair general market competitiveness. 126 [\*1200] Limiting the scope of judicial review to economic regulations impairing competition also raises a question of legal principle. As to antitrust, it is easy to justify such a principle. Notwithstanding Oliver Wendell Holmes's protestation that the Sherman Act "says nothing about competition," 127 a century of judicial construction has oriented the antitrust laws towards a singular focus on competition. 128 On the other hand, it is not obvious that constitutional scrutiny should rise or fall on the effects a cronyist regulation has on competition. It may be true that "protecting a discrete interest group from economic competition is not a legitimate governmental purpose," 129 but it seems equally true that dispensing economic rents to favored discrete interest groups more generally is also not a legitimate government purpose. In either case, the argument for limiting judicial review is not that the set of targeted regulations is constitutionally legitimate, but that the process of separating sheep from goats is fraught with the potential for judicial usurpation.

B. Considering Governmental Justifications for Restraints on Competition

Assuming that judicial review of anticompetitive state and local regulations is to occur with some degree of bite, the fighting question may often become how to evaluate the state's proffered justifications for the restraint on competition. Both antitrust and constitutional tools would need to allow ample room for the state to demonstrate verifiable justifications for the challenged regulations. To put this point in antitrust parlance, there are no per se unlawful state restraints on competition--the state's reasons for regulating will always be up for review in judicial or administrative proceedings challenging their validity. [\*1201] The critical question is how much interrogation into the state's proffered justifications a court or reviewing agency would, could, or should undertake. In conventional post-Lochner terms, economic regulations were subjected to no more than rational basis review--an exceedingly deferential standard of review. 130 The state did not have to advance any empirical support for its proffered justifications and, indeed, did not have to advance any justifications at all. 131 Judges were supposed to uphold the regulation if they could conceive of any justification that might plausibly support it: A State, moreover, has no obligation to produce evidence to sustain the rationality of a statutory classification. "[A] legislative choice is not subject to courtroom factfinding and may be based on rational speculation unsupported by evidence or empirical data." A statute is presumed constitutional, and "[t]he burden is on the one attacking the legislative arrangement to negative every conceivable basis which might support it," whether or not the basis has a foundation in the record. Finally, courts are compelled under rational-basis review to accept a legislature's generalizations even when there is an imperfect fit between means and ends. A classification does not fail rational-basis review because it "is not made with mathematical nicety or because in practice it results in some inequality." 132 That sort of rational basis review is far from the sort of review conducted by the Craigmiles and St. Joseph Abbey courts in striking down the Tennessee and Louisiana casket rules. 133 Those courts required evidentiary support for states' claimed justifications and subjected the states' claims to rigorous cross-examination for logical consistency. 134 In the Sixth Circuit case--Craigmiles--the court rejected the state's arguments that the casket regulation protected casket quality and public health, made it more feasible for casket sellers to advise bereaved families about which casket was most suitable for their needs, and protected against sharp business [\*1202] dealing. 135 The court found these arguments inconsistent with the state's own regulatory practices and unsupported by any record evidence. 136 Similarly, in the Fifth Circuit case--St. Joseph Abbey--the court repeated the familiar proposition that "rational basis review places no affirmative evidentiary burden on the government," but quickly added that "plaintiffs may nonetheless negate a seemingly plausible basis for the law by adducing evidence of irrationality." 137 The court then inquired into evidentiary support for the state's proferred "rational bases." 138 For example, on the ostensible consumer protection rationale for prohibiting casket sales except by licensed funeral parlors, the court observed that the FTC had largely rejected this argument as an empirical matter, noting that the FTC found "insufficient evidence that … third-party sellers of funeral goods are engaged in widespread unfair or deceptive acts or practices" and that the empirical "record [is] 'bereft of evidence indicating significant consumer injury caused by third-party sellers.'" 139 This form of review resembles antitrust litigation, where once a plaintiff raises a prima facie case of anticompetitive effect (outside of per se rules, where no justifications are allowed), the defendant typically can proffer procompetitive justifications but bears the burden of offering evidentiary support. 140 Although giving lip service to the norms of rational basis review, these courts were in fact taking a hard look at the states' proffered justifications once the regulation in question appeared prima facie to meet the description of a measure designed to protect "discrete interest group[s] from economic competition." 141 Inquiries into offsetting justifications for prima facie suspect conduct raise two doctrinal-analytical questions: (1) how tight must the fit between means and ends be in order for the conduct in question to survive scrutiny, and (2) once the conduct has been shown to advance legitimate ends, should its harms be balanced against its [\*1203] benefits, or should it simply be deemed lawful without any balancing? 142 Both constitutional and antitrust tools for addressing anticompetitive regulation would need to address these questions. As to the first question--the required tightness of means-ends fit--both constitutional and antitrust law already contain suitable doctrines. Moving up the ladder of scrutiny from rational basis review, intermediate scrutiny in constitutional law (such as that applicable to content-neutral restrictions on speech) requires that the restriction in question advance important governmental interests and not burden the protected interest (speech in the speech cases, competition in competition cases) more than necessary to further these interests. 143 The fit between means and ends need be only "reasonable," not strictly necessary or essential. 144 Unless the constitutional limitation on anticompetitive cronyism should fall into the more stringent strict scrutiny category--a very doubtful possibility--this sort of fit between regulatory means and ends would seem applicable. Antitrust law shares a similar approach to the less restrictive alternative analysis under the rule of reason, and it too would presumably apply to government restraints on competition under an expanded form of judicial review. 145 As explained in the Justice Department and FTC competitor collaboration guidelines, a reasonable, but not essential, fit between means and ends is required to credit proffered justifications for prima facie anticompetitive agreements: The Agencies consider only those efficiencies for which the relevant agreement is reasonably necessary. An agreement may be "reasonably necessary" without being essential. However, if the participants could have achieved or could achieve similar efficiencies by practical, significantly less restrictive means, then the Agencies conclude that the relevant agreement is not [\*1204] reasonably necessary to their achievement. In making this assessment, the Agencies consider only alternatives that are practical in the business situation faced by the participants; the Agencies do not search for a theoretically less restrictive alternative that is not realistic given business realities. 146 A potential difference between constitutional and antitrust analysis might arise on the second important means-ends question--whether to balance harms against benefits of the regulatory restriction. For example, suppose that a regulation limiting ride-sharing services resulted in some small safety benefit to customers but an arguably much greater harm to customers in the form of diminished choice of service options and higher prices. Should a reviewing court or agency balance the safety enhancements against the harms to competition, or should it rather conclude that, having shown a legitimate reason for its existence, the regulation should stand? Although intermediate scrutiny in constitutional law is often described as a "balancing test," courts do not generally engage in explicit balancing after passing the less restrictive alternatives inquiry. 147 Some degree of value judgment must be embedded in the inquiry into whether the state's interest is sufficiently "important," but it is rare to see a court say, in effect, that although the state's interest is concededly important and the regulation at stake is reasonably related to it, the harms caused by the regulation outweigh its benefits. 148 For purposes of the principle against protecting "discrete interest group[s] from economic competition," it seems apparent that there is no room for balancing at all, as a state [\*1205] regulation that serves some legitimate end by definition is not "simple economic protectionism." 149 By contrast, antitrust law is, in principle, supposed to require open-ended balancing at this final step: "if the monopolist's procompetitive justification stands unrebutted, then the plaintiff must demonstrate that the anticompetitive harm of the conduct outweighs the procompetitive benefit." 150 If followed in state action doctrine cases, this sort of balancing could precipitate serious accusations of Lochnerizing, as it would put judges in the position of substituting their own preferences for market outcomes over the state's legitimate regulatory objectives. Fortunately, although antitrust law nominally calls for balancing, courts typically do not engage in it. 151 Even in Microsoft--the case that most explicitly and authoritatively called for final-stage balancing--the D.C. Circuit engaged in very little, if any, true balancing. 152 Perhaps because of the incommensurability between anticompetitive or procompetitive effects or concern about chilling procompetitive conduct, courts tend to exonerate competitive behavior that is necessary to procompetitive effects without asking whether the harms outweigh the benefits. 153 In order to stave off Lochnerizing concerns, any expanded antitrust review of state and local regulations might need to formalize this practice doctrinally: Once a state demonstrates that the regulation in question is reasonably tailored to achieve some legitimate governmental objective, [\*1206] antitrust does not require balancing of the harms to competition against the legitimate governmental objectives. A final question unique to antitrust review is whether, when it comes to means-ends review, the catalogue of permissible ends is limited to those recognized by antitrust law as "procompetitive." One of the important doctrinal and policy structures of antitrust law is a division of the world into virtues that are said to be "procompetitive" and those that are not. 154 To count as a legitimate virtue in the antitrust domain, an effect must be "procompetitive," meaning that it must work to enhance or improve market competition. 155 Supposed benefits of a restraint that assume that competition is itself the problem in need of curtailment are labeled with the epithet of "ruinous competition" theories and are dismissed as inconsistent with the Sherman Act's procompetition policy. 156 While this single-minded devotion to competition may make sense as to the world of private restraints, it is less clear that it can be applied sensibly to governmental regulation. Do governments not have the right to take the view that competition of certain types causes social evils that should be curtailed? For example, many regulatory restrictions on alcohol and tobacco distribution are designed to decrease competition and hence reduce output as compared to that which would be obtained in a competitive market. 157 While it may be undesirable for private actors to limit harmful output through private means, the state's police power surely includes the right to do so, including by limiting competition. 158 This suggests that the range of regulatory interests [\*1207] states might legitimately advance in support of challenged regulations would be broader than those deemed "procompetitive" in conventional antitrust analysis. Opening the door to a wider scope of justifications in cases where the restraint on competition is imposed by governmental rather than private actors would appear on first impression to favor the government. Such a widening of the rule of reason, however, raises precisely the Lochnerizing concern raised by Justice Rehnquist in his previously quoted City of Boulder dissent. 159 If courts were called upon to balance health and safety benefits against traditional competition concerns around prices and innovation, then they might well slip into a Lochnerizing mold. But perhaps such concerns could be abated by limiting the reviewing court or agency's role to determining whether the regulation in question actually supported the state's proffered goals. As long as the goals were permissible (that is, not simply protecting discrete interest groups from competition as a form of political patronage) and the regulations were reasonably related to the goals, the reviewing court or agency would not inquire more broadly into the regulation's overall desirability.

C. Institutional and Procedural Distinctions

Antitrust preemption and constitutional review are differently situated in one significant way: Constitutional equal protection, substantive due process, and dormant commerce clause principles are privately enforceable by any party that meets the Article III standing requirements--which, in this context, means at least anyone directly affected by a regulation impairing competition. 160 Antitrust has its own private right of action standing rules, 161 as well as an additional institutional feature that might significantly limit some of the abuses associated with Lochnerizing. One proposed route for increasing the preemptive scope of federal antitrust law over anticompetitive state and local regulation is to hold the [\*1208] Parker doctrine inapplicable to the FTC. 162 This would give the FTC enhanced power to challenge anticompetitive state and local regulations. Not only would this limit the incidence of challenges to state regulation (the FTC Act is not privately enforceable and only the Commission can initiate an action under the Act), 163 but it would also put the Commission itself, rather than an Article III court, in the position of making an initial decision on the case. An Article III court could ultimately become involved, as adverse Commission decisions are appealable to any federal court of appeal in which the case could have been initially brought. 164 However, lodging the antitrust review function in the FTC would grant the Commission an initial regulatory review function and the power to make factual findings subject to "substantial evidence" review. 165

### 1AC---Plan

The United States Federal Government should significantly increase prohibitions on anticompetitive business practices by the private sector shielded by use of state action immunity.

### 1AC---Federalism

#### Advantage Two is Federalism:

#### Scenario 1 is Tech:

#### Nextgen tech is emerging at an exponential rate – effective state regulatory experimentation avoids downsides and maximize the benefits of AI and nano

McGinnis 11 (John, George C. Dix Professor of Law, Northwestern Law School, “LAWS FOR LEARNING IN AN AGE OF ACCELERATION,” <http://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=3404&context=wmlr>)

The twenty-first century’s information age has the potential to usher in a more harmonious and productive politics. People often disagree about what policies to adopt, but the cornucopia of data that modern technology generates can allow them to better update their beliefs about policy outcomes on the basis of shared facts. In the long run, convergence on the facts can lead incrementally to more consensus on better policies. More credible factual information should over time also help make for a less divisive society, because partisans cannot as easily stoke social tensions by relying on false facts or exaggerated claims to support conflicting positions. Thus, a central task of contemporary public law is to accelerate a politics of learning whereby democracy improves a public reason focused on evaluating policy consequences. Government should be shaped into an instrument that learns from the analysis of policy consequences made available from newly available technologies of information.1 Greater computer capacity is generating more empirical analysis.2 The Internet permits the rise of prediction markets that forecast policy results even before the policies are implemented.3 The Internet also creates a dispersed media that specializes in particular topics and methodologies, gathers diverse information, and funnels salient facts about policy to legislators and citizens.4 But a public reason focused on policy consequences will improve only if our laws facilitate it. For instance, constitutional federalism must be reinvigorated to permit greater experimentation across jurisdictions, because with the rise of empiricism, decentralization has more value for social learning today than ever before.5 Congress should include mandates for experiments within its own legislation making policy initiatives contain the platforms for their own selfimprovement.6 Creating a contemporary politics of democratic updating on the basis of facts is a matter both of great historical interest and of enormous importance to our future. In the historical sweep of ideas, a government more focused on learning from new information moves toward fulfilling the Enlightenment dream of a politics of reason—but a reason based not on the abstractions of the French Revolution, but instead on the hard facts of the more empirical tradition predominating in Britain. By displacing religion from the center of politics, the Enlightenment removed issues by their nature not susceptible to factual resolution, permitting a focus on policies that could be improved by information.7 The better democratic updating afforded by modern technology can similarly increase social harmony and prosperity by facilitating policies that actually deliver the goods. For the future, a more consequentially informed politics is an urgent necessity. The same technological acceleration that potentially creates a more information-rich politics also generates a wide range of technological innovation—from nanotechnology to biotechnology to [AI] artificial intelligence. Although these technologies offer unparalleled benefits to mankind, they may also create catastrophic risks, such as rapid environmental degradation and new weapons of mass destruction.8 Only a democracy able to rapidly assimilate the facts is likely to be able to avoid disaster and reap the benefits inherent in the technology that is transforming our world at a faster pace than ever before. Every industry that touches on information—book publishing, newspapers, and college education to name just a few—is undergoing a continuous series of revolutionary changes as new technology permits delivery of more information more quickly at lower cost. The same changes that are creating innovation in such private industries can also quickly create innovation in social governance. But the difference between information-intensive private industries and political institutions is that the latter lack the strong competitive framework for these revolutions to occur spontaneously. This Essay thus attempts to set out a blueprint for reform to make better use of some available information technologies. Part I describes the reality of technology acceleration as the acceleration both creates the tools for democratic updating and prompts its necessity. Technological acceleration is the most important development of our time—more important even than globalization. Although technologists have described and discussed its significance, its implications for law and political structure have been barely noticed. Part II briefly discusses how better social knowledge can change political results. A premise of the claim is that some political disagreements revolve about facts, not simply values. As a result, better social knowledge can help democracies design policies to achieve widely shared goals. Social knowledge energizes citizens to act on those encompassing interests, like improved public education, because they come to better recognize the policy instruments to advance those interests. Better social knowledge provides better incentives for citizens to vote on these interests. Part III considers the mechanisms for creating a contemporary politics of democratic updating that begins to meet the needs of the age of accelerating technology. It focuses on two of the new resources that can have substantial synergies in improving social common knowledge and shows how an increase in common knowledge can systematically improve political results by providing better incentives for citizens to work for encompassing social goods. First, Part III considers the improvement in empirical analysis of social policy that flows from increasing computational capacity. It then discusses how specialized and innovative media does much more than disseminate opinions: it widely distributes facts and factual analysis. The combination of these technologies can better discipline experts and representatives, providing stronger incentives for them to update on the basis of new facts. Part IV discusses the information-eliciting rules that will maximize the impact of new technologies of information. These steps include a program of restoring, where possible, governmental structures that permit appropriate decentralization for experimentation, empirical testing, and learning. Congress and regulatory agencies should structure legislation and regulations to include social experiments when such experiments would help resolve disputed matters of policy. The Supreme Court should generally refrain from imposing new substantive rights for the nation so that it is easier to evaluate the consequences of different bundles of rights chosen by the states. But it should also protect the dispersed media, like blogs, from discriminatory laws, because this dispersed media plays a crucial role in modern policy evaluation. In short, the Supreme Court needs to emphasize a jurisprudence fostering social discovery and the political branches need to create frameworks for better social learning. Constitutive structures encouraging and evaluating experimentation become more valuable in an age where better evaluation of social experiments is possible. I. TECHNOLOGICAL ACCELERATION It is the premise of this Essay that technological acceleration is occurring and that our political system must adapt to the world it is creating. The case for technological acceleration rests on three mutually supporting kinds of evidence. First, from the longest-term perspective, epochal change has sped up: the transitions from hunter-gatherer society to agricultural society to the industrial age each took progressively less time to occur, and our transition to an information society is taking less time still. Second, from a technological perspective, computational power is increasing exponentially, and increasing computational power facilitates the growth of other society-changing technologies like biotechnology and nanotechnology. Third, even from our contemporary perspective, technology now changes the world on a yearly basis both in terms of hard data, like the amount of information created, and in terms of more subjective measures, like the social changes wrought by social media. From the longest-term perspective, it seems clear that technological change is accelerating and, with it, the basic shape of human society and culture is changing.9 Anthropologists suggest that for 100,000 years, members of the human species were hunter-gather- ers.10 About 10,000 years ago humans made a transition to agricultural society.11 With the advent of the Industrial Revolution, the West transformed itself into a society that thrived on manufacturing.12 Since 1950, the world has been rapidly entering the information age.13 Each of the completed epochs has been marked by a transition to substantially higher growth rates.14 The period between each epoch has become very substantially shorter.15 Thus, there is reason to extrapolate to even more and faster transitions in the future. This evolution is consistent with a more fine-grained evaluation of human development. Recently, the historian Ian Morris has rated societies in the last 15,000 years on their level of development through objective benchmarks, such as energy capture.16 The graph shows relatively steady, if modest, growth when plotted on a log linear scale, but in the last 100 years development has jumped to become sharply exponential.17 Morris concludes that these patterns suggest that there may be four times as much social development in the world in the next 100 years than there has been in the last 14,000.18 The inventor and engineer Ray Kurzweil has dubbed this phenomenon of faster transitions “the law of accelerating returns.”19 Seeking to strengthen the case for exponential change, he has looked back to the dawn of life to show that even evolution seems to make transitions to higher organisms ever faster.20 In a more granulated way, he has considered important events of the last 1000 years to show that the periods between extraordinary advances, such as great scientific discoveries and technological inventions, have decreased.21 Thus, both outside and within the great epochs of recorded human history, the story of acceleration is similar. The technology of computation provides the second perspective on accelerating change. The easiest way to grasp this perspective is to consider Moore’s Law. Moore’s Law—named after Gordon Moore, one of the founders of Intel—is the observation that the number of transistors that can be fitted onto a computer chip doubles every eighteen months to two years.22 This prediction, which has been approximately accurate for the last forty years,23 means that almost every aspect of the digital world—from computational calculation power to computer memory—is growing in density at a similarly exponential rate.24 Moore’s Law reflects the rapid rise of computers to become the fundamental engine of mankind in the late twentieth and early twenty-first centuries.25 The power of exponential growth is hard to overstate. As the economist Robert Lucas has said, once you start thinking about exponential growth, it is hard to think about anything else.26 The computational power in a cell phone today is a thousand times greater and a million times less expensive than all the computing power housed at MIT in 1965.27 Projecting forward, the computing power of computers twenty-five years from now is likely to prove a million times more powerful than computing power today. To be sure, many people have been predicting the imminent death of Moore’s Law for a substantial period now,29 but it has nevertheless continued. Intel—a company that has a substantial interest in accurately telling software makers what to expect—projects that Moore’s Law will continue at least until 2029.30 Ray Kurzweil shows that Moore’s Law is actually part of a more general exponential computation growth that has been gaining force for over a 100 years.31 Integrated circuits replaced transistors that previously replaced vacuum tubes that in their time had replaced electromechanical methods of computation.32 Through all of these changes in the mechanisms of computation, its power increased at an exponential rate.33 This perspective suggests that other methods under research—from carbon nanotechnology to optical computing to quantum computing—are likely to continue growing exponentially even when silicon-based computing reaches its physical limits.34 Focusing on the exponential increase in hardware capability may actually understate the acceleration in computational capacity in two ways. First, a study considering developments in a computer task using a benchmark for measuring computer speed over a fifteen-year period suggests that the improvements in software algorithms improved performance even more than the increase in hardware capability.35 Second, computers are interconnected more than ever before through the Internet, and these connections increase collective capacity, not only because of the increasing density among computer connections, but because of the increasing density of connections among humans made possible by computers. The salient feature of computers’ exponential growth is their tremendous range of application compared to previous improvements. Almost everything in the modern world can be improved by adding an independent source of computational power. That is why computational improvement has a far greater social effect than improvements in technologies of old. Energy, medicine, and communication are now being continually transformed by the increase in computational power.36 As I will discuss in Part II, even the formulation of new hypotheses in natural and social science will likely be aided by computers in the near future. The final perspective on accelerating technology is the experience that the contemporary world provides. Technology changes the whole tenor of life more rapidly than ever before. At the most basic level, technological products change faster.37 Repeated visits to a modern electronics store—or even a grocery store—reveal a whole new line of products within very few years. In contrast, someone visiting a store in 1910 and then again in 1920—let alone in 1810 and 1820—would not have noticed much difference. Even cultural generations move faster. Facebook, for instance, has changed the way college students relate in only a few years,38 whereas the tenor of college life would not have seemed very different to students in 1920 and 1960. Our current subjective sense of accelerating technology is also backed by more objective evidence from the contemporary world. Accelerating amounts of information are being generated.39 Information, of course, is a proxy for knowledge. Consistent with this general observation, we experience exponential growth in practical technical knowledge, as evidenced by the rise in patent applications.40 Thus, the combination of data from our present life, together with the more sweeping historical and technological perspectives, makes a compelling case that technological acceleration is occurring. It is this technological acceleration that creates both the capacity and the need for improving collective decision making. As technology accelerates, it creates new phenomena, from climate change to biotechnology to artificial intelligence of a human-like capacity. These technologies may themselves have very large positive or negative externalities and may require government decisions about their prohibition, regulation, or subsidization to forestall harms and capture their full benefits. They may also cause social dislocations, from unemployment to terrorism, that also require certain collective decisions. Society can best handle these crises not only by making better social policy to address them directly but by improving social policy more generally to create both more resources and more social harmony to endure them. Thus, society must deploy information technology in the service of democratic updating if it is to manage technological acceleration

#### Effective regulations solve extinction

Matus 14 [Kira Matus, PhD, Havard University. Associate Head and Associate Professor, Division of Public Policy, Hong Kong University of Science and Technology. "Existential risk: challenges for risk regulation." Risk and Regulation (Winter 2014). https://futureoflife.org/data/documents/Existential%20Risk%20Resources%20(2015-08-24).pdf?x93895]

There is a trend in many areas towards attention to ‘big’ risks. Financial regulation has become increasingly concerned with so‐called systemic risks. Others, and not just Hollywood blockbusters, have been attracted to the study of civilization‐destroying catastrophic risks. Indeed, the OECD has become increasingly interested in ‘high level’ risks and ways in which different national governments seek to prepare for and manage actual events, such as the aftermath of major earthquakes, or the response to a terrorist attack. The notion of ‘existential’ risk might be adding to the cacophony of emerging ‘big’ risk concerns. However, existential risk deserves special attention as it fundamentally adds to our understanding of particular types of risks, and it also challenges common wisdom regarding actions designed to support continued survival.

What is existential risk? We can approach this question by looking at several attributes. The first attribute is what, in fact, is at risk. One set of existential risks are those that threaten survival. These are the acute catastrophes, i.e. the idea that particular events’ impacts are likely to extinguish civilization. Such risks have been identified when it comes to asteroids, nuclear war, and other largescale events that undermine the possibility for survival in general, or, at least, in large regions. A second set is based on the idea that existential risks are not just about physical survival, but about the survival of ways of life. In other words, certain risks are seen as threatening established ways of doing things, cultures, social relationships, and understandings of the ‘good life’. There is, of course, much disagreement about what the good life constitutes, and therefore there will always be disagreement as to what exactly an existential risk constitutes.

A second attribute is the degree to which an existential risk is triggered by a single catastrophic incident. Existential risks arise not merely from one‐off large incidents, such as earthquakes, tsunamis, nuclear meltdowns or, indeed, asteroid hits. Rather, existential risks are about complex, inter‐related processes that result in cascading effects that move across social systems. The overall impact of these system changes could result in the types of physical or cultural destruction that is the focus of the first two perspectives.

Whether triggered by catastrophic events or complex cascades, standard operating procedures are unlikely to be sufficient for dealing with existential risks; instead, this is a space in which improvisation and creativity are required. A third attribute of existential risks is the challenge they present to standard approaches to risk regulation. Existential risks are defined by their cross‐systematic nature; a failure within one system (say, finance) has not just catastrophic implications for the sector in question, but threatens the survival of another system (say, the environment, as funding for particular measures dries up). In other words, the focus of existential risks is not just on the systemic level, it focuses on the cross‐ systemic dimension that is even more difficult to predict and assess than attempts aimed at establishing activities that are of ‘systemic’ relevance by regulatory systems that tend to be narrowly focused and independent from each other. Existential risks are characterized by a fourth feature, namely the idea that existential risks lead to responses based upon fear. Individuals are confronted with fears about their survival (death) and about the meaning of their lives. This aspect of existential risk is particularly troublesome in an age of low trust in authority and, consequently, a political style that is intolerant of ‘blame free’ spaces. In the absence of confidence in public authority, few options remain. For some, the solution will rely on framework plans, pop intellectuals and other fashionable ideas that seem to offer redemption from the fear of extinction. Others will prefer to ‘go it alone’ and seek to develop their own plans for survival, noting that risk taking is, after all, an individual choice. Others, again, will deny the legitimacy of public authority and veer towards those choices that have been legitimized by their own communities. Finally, some will deny that existential risks exist in the first place. In other words, individual responses to existential risks vary considerably and pose challenges for any risk management and communication strategy.

#### Unregulated tech diffuses globally---acquisition by omnicidal non-state actors risks extinction via super-pathogens, eco-terrorism, and planetoid bombs.

Torres 21 (Phil Torres, Former writer for Future of Life Institute, Former Affiliate Scholar at the Institute for Ethics and Emerging Technologies, M.A. in Neuroscience from Brandeis University, Ph.D. candidate at Leibniz Universität Hannover; “International Criminal Law and the Future of Humanity: A Theory of the Crime of Omnicide;” 03-08-21, <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3777140>, TM)

3.2 The Greatest Threats Arise from Nonstate Actors. Since the Neolithic Revolution some 12,000 years ago, groups of people—tribes, city-states, kingdoms, countries, and empires—have invariably possessed a greater potential to cause harm than individuals or small collections of individuals within those groups. For example, the Roman Empire considered as a cohesive entity was more powerful than any Roman citizen, just as Nazi Germany had more resources to leverage against the Jewish people than any single antisemite. (This idea finds expression in Max Weber’s famous characterization of the state as possessing a “monopoly of the legitimate use of violence within a given territory.”70) But this dynamic is quickly changing: the difference in “violence capacity” between state and nonstate actors is narrowing as a result of the growing power and accessibility of dual-use emerging technologies, which are almost universally being developed at an exponential or superexponential pace, in accordance with the so-called Law of Accelerating Returns, which subsumes more specific tends like Moore’s Law, Huang’s law, the Carlson curve, Dennard scaling, Keck’s law, Kryder’s law, and so on. As the “power and accessibility” locution 71 implies, there are two crucial features of such technologies, namely:

(i) Omniviolence thesis. The growing power of emerging technologies means a lower ratio of “killers to killed,” or “K/K ratio,” per incident, a phenomenon that Daniel Deudney neologizes as “omniviolence.” Consider a non-lethal recent case that exemplifies this trend: the 2016 Dyn 72 cyberattack. This distributed denial-of-service (DDoS) attack may have been perpetrated by a single “angry gamer.”73 Yet an extraordinary number of major websites were disrupted: Airbnb, Amazon, BBC, The Boston Globe, CNN, Comcast, FiveThirtyEight, Fox News, The Guardian, iHeartRadio, Imgur, National Hockey League, Netflix, The New York Times, PayPal, Pinterest, Pixlr, Reddit, SoundCloud, Squarespace, Spotify, Starbucks, Storify, the Swedish Government, Tumblr, Twitter, Verizon Communications, Visa, Vox Media, Walgreens, The Wall Street Journal, Wired, Yelp, and Zillow. This is a non-exhaustive list of the websites affected, which numbered more 74 than 60 in total. Thus, the “affecter-to-affected ratio,” so to speak, of this attack was extremely low: one person managed to take down a vast constellation of websites that hundreds of millions of people visit and depend upon every day. The point is that this trend of mass empowerment can be found within virtually every domain of emerging technology, including biotechnology, synthetic biology, nanotechnology, drone technology, and artificial intelligence. Whereas in the past, bioterrorism took the form of poisoning wells with carcasses contaminated with the plague, soon it could take the form of synthesizing a super-pathogen that combines the lethality of rabies, the incurability of Ebola, the contagiousness of the common cold, and the long incubation period of HIV. Whereas in the 75 past, destroying an enemy civilization required a physical attack involving tens or hundreds of thousands of soldiers, today a nuclear electromagnetic pulse (NEMP) could fry the electrical infrastructure of an entire country. Whereas in the past, annihilating Earth’s biosphere was technically impossible, future self-replicating nanobots could potentially disassemble all organic matter around the world, thus resulting in a lifeless, barren planet. And so on.

(ii) Democratization thesis. This refers to the phenomenon of dual-use emerging technologies becoming increasingly accessible to the demos. When combined with (i), it implies that omniviolence is being distributed among state and nonstate actors—i.e., the K/K ratio is falling while the number of potential “killers” that instantiate the first “K” is growing.

Historically speaking, the first actor—a state—to acquire the technological ability to unilaterally destroy the world was the United States, sometime around 1948 or 1949, when the United States stockpiled enough nuclear weapons, about 100 in total, to have single-handedly initiated a worldwide nuclear winter. I choose the number “100” here because a 2008 study found that a regional “nuclear exchange involving 100 Hiroshima-size bombs (15 kilotons) on cities in the subtropics” could effectively “lower temperatures regionally and globally for several years, open up new holes in the ozone layer protecting the Earth from harmful radiation, reduce global precipitation by about 10 percent, and trigger massive crop failures.” Thus, bracketing the nontrivial 76 fact that many weapons built since World War II have a far greater explosive yield than 15 kilotons of TNT, we can crudely estimate when countries acquired the capacity to unilaterally cause a global nuclear winter by identifying the years during which their arsenals exceeded 100 nuclear weapons. On this criterion—for perspective, consider that the United State’s “Castle Bravo” weapon was equivalent to 15 megatons of TNT, while the Soviet Union’s “Tsar Bomba” had an extraordinary 58 megaton yield—the Soviet Union joined the club of potential world-destroyers at least by 1952, the United Kingdom at least by 1962, China at least by 1971, France at least by 1973, and other countries like Pakistan, India, and Israel perhaps by the 2010s, depending on the make-up of their arsenals.77 Thus, since World War II, the number of entities with doomsday capabilities has grown from zero to eight.

But the democratization of dual-use emerging technologies is rapidly transforming this predicament by multiplying the number of not only state but, far more importantly, nonstate actors having the capacity to unilaterally destroy the world. As I have previously discussed, there are four axes along which this trend, which I have elsewhere dubbed the “threat of universal unilateralism,” is unfolding. In brief, these are:

(i) The intelligence threshold that must be exceeded to effect large-scale destruction is lowering. This fact is humorously, but accurately, captured by Eliezer Yudkowsky’s so-called “Moore’s Law of Mad Science,” which states that “every eighteen months, the minimum IQ necessary to destroy the world drops by one point.” (ii) The information threshold that one must exceed to use 78 a wide range of emerging technologies in a competent manner is also falling. For example, the genomes of many of the most dangerous pathogens, including Ebola and smallpox, are readily accessible online, thus making such information easy to copy-paste onto one’s computer. (iii) The skill threshold that one must exceed to convert one's know-that into actionable know-how is dropping as well. Perhaps the most conspicuous example comes from synthetic biology, which is “explicitly devoted to the minimization of the importance of tacit knowledge.” The BioBricks 79 Foundation’s standardization of biological entities and devices like digital-to-biological converters are also relevant here. Yet the irrelevance of tacit knowledge may be especially salient with respect to molecular nanotechnology—e.g., nanofactories that can manufacture virtually any technical product for virtually zero cost given a digital blueprint, source of energy, and feedstock molecule like acetone or acetylene.81 And finally, (iv) the materials and equipment necessary for omniviolence are rapidly becoming more widely available and affordable. For example, the advent of nanofactories would make it possible to produce super-high-quality technical products of all sorts at almost no cost, and third-generation laser enrichment technologies such as SILEX (whereby uranium isotopes are separated by laser excitation) could enable small groups or lone individuals to produce weapons-grade uranium without the need for costly, large centrifuges.82

To couch the implications of these four trends in terms of the 2016 Dyn cyberattack, it is no longer unreasonable to ask in the wake of a major incident spanning multiple countries and affects millions of people whether the perpetrator is a state actor like Russia or North Korea, or someone in [their] ~~her or his~~ basement, with limited knowledge of computer systems or how to initiate a DDoS attack, using a $1,000 computer. To underline this point, consider the following two scenarios that could potentially cause the extinction of humanity. Both illustrate the fact that, as Benjamin Wittes and Gabriella Blum observe, greater technological capabilities entail greater susceptibility to harm; in their words, “technologies that expand the power to attack necessarily expand vulnerability to attack.”83 However, for reasons relating to “information hazards,”84 I have not chosen the most effective ways of bringing about human extinction that scholars in the nascent field of “existential risk studies” have privately devised (and kept secret within the community for information-hazard reasons), nor will I go into much detail about the logistics of actually realizing these scenarios. The simple point is merely to emphasize that we are, indeed, entering a new era of unprecedentedly distributed destructive capabilities.

Scenario 1: The CRISPR/Cas9 system consists of a segment of DNA from bacterial immune systems—CRISPR—and a protein that acts as “molecular scissors” capable of cutting DNA at target sequences—Cas9—which are specified by an RNA guide molecule. This system has enabled scientists to alter the genomes of organisms with unprecedented precision. Now consider “gene drives,” or genetic mechanisms that enable a segment of DNA to be inherited by an organism’s offspring at a probability of greater than 50 percent, even when the allele expressed by the gene is deleterious to the organism. Gene drives are found in nature, but advancements in synthetic biology are enabling scientists to create them artificially. Combining these two technologies: CRISPR/Cas9 and gene drives will enable the synthesis of genes that propagate through and decimate entire populations of organisms. At the extreme, so-called “suppression drives” that “reduce the population of the target species (for example by damaging a gene with a function essential to survival or reproduction)” could precipitate the extinction of the affected species.85

Now imagine that a terrorist sets up a “biohacker” lab with some basic synthetic biology capabilities. It will soon be feasible for a group or lone wolf to create suppression drives that target, for example, the primary pollinators: bees, wasps, moths, butterflies, and beetles. If these short-generation species were to perish, the result would be a cascade of disasters that E.O. Wilson adumbrates as follows, to quote him at length:

A majority of flowering plants, upon being deprived of their pollinators, cease to reproduce. Most herbaceous plant species among them spiral down to extinction. Insect-pollinated shrubs and trees hang on for a few more years, in rare cases of up to centuries. The great majority of birds and other land vertebrates, now denied the specialized foliage, fruits, and insect prey on which they feed, follow the plants into oblivion. The soil remains largely unturned, accelerating plant decline, because insects, not earthworms as generally supposed, are the principal turners and renewers of the soil. Populations of fungi and bacteria explode and remain at a peak over a few years while metabolizing the dead plant and animal material that piles up. Wind-pollinated grasses and a handful of fern and conifer species spread over much of the deforested terrain, then decline to some extent as the soil deteriorates. The human species survives, able to fall back on wind-pollinated grains and marine fishing. But amid widespread starvation during the first several decades, human populations plunge to a small fraction of their former level. The wars for control of the dwindling resources, the suffering, and the tumultuous decline to dark-age barbarism would be unprecedented in human history.86

In sum, CRISPR/Cas9 plus gene drives will open the door to unprecedentedly effective omnicidal attacks.

Scenario 2: The human expansion into space has historically coincided with the militarization of space. That is to say, the very first human-made artifact to reach space was the V2 ballistic missile built by Nazi Germany. The militarization of space continues today, with President Donald Trump, for example, announcing in 2018 the creation of a “United States Space Force” branch of the Armed Forces by 2020. But the situation is becoming more complicated as space simultaneously becomes increasingly privatized. Private companies are already delivering supplies to the International Space Station (ISS), and some plan to deliver satellites and offer tourists trips up to 50 miles above the ground, where the mesosphere becomes the thermosphere. Even more, molecular nanotechnology, which would enable one to manipulate matter with absolute atomic precision, could open up the space frontier to most everyone.87 In particular, nanofactories might enable groups and even individuals with no prior knowledge of rocket science and no manufacturing skills to build their own orbital spacecraft.88

The implications of this are unsettling, not just because more objects in space would increase the probability of an accidental Kessler syndrome (whereby shrapnel initiates a positivefeedback cascade that destroys all satellites in the Lower Earth Orbit), but because of the so-called “deflection dilemma.” This arises from the fact that technologies capable of redirecting larger asteroids or comets away from Earth could also be used to direct them toward Earth, a possibility taken seriously by many astronomers. The idea is simply that Earth is not safe from extraterrestrial impacts, a view that scientists almost unanimously rejected until the Alvarez hypothesis was vindicated by tests on the Chicxulub crater in 1990. In other words, there have been major impact events in the past and there will be more in the future. Hence, it is critical that humanity designs and builds spacecraft that could nudge incoming celestial bodies past Earth. But the dual usability of such technologies would also enable [malevolent actors] “~~madmen~~”—to borrow Sagan’s preferred term90—to potentially annihilate humanity by converting otherwise non-threatening asteroids or comets into “planetoid bombs” that smash into Earth and, in doing so, initiate a global impact winter of the sort that killed-off the non-avian dinosaurs 66 million years ago. Given the democratization of space technologies, this scenario could become increasingly probable in the coming decades.

These two scenarios illustrate the proposition that nonstate actors could plausibly bring about an omnicidal catastrophe with existing and emerging dual-use technologies. Indeed, state actors are far less likely to attempt to cause human extinction than nonstate actors, since states generally value their continued existence. For example, if humanity were to go extinct, then aspiring global autocrats (perhaps Vladimir Putin or Kim Jung-un) would be unable to fulfill their megalomaniacal ambitions. Similarly, if Hitler had destroyed the world in 1941, his vision of a Thousand Year Reich would not have been realizable. Yet Sagan notes that

in the winter and spring of 1945, Hitler ordered Germany to be destroyed—even “what the people need for elementary survival”—because the surviving Germans had “betrayed” him, and at any rate were “inferior” to those who had already died. If Hitler had nuclear weapons, the threat of a counterstrike by Allied nuclear weapons, had there been any, is unlikely to have dissuaded him. It might have encouraged him.91

The point is that under normal circumstances, states are pro-human-survival; they are much less likely to attempt an omnicidal attack than nonstate actors, who may be motivated by a range of “kill everyone” ideologies. In previous papers, I have outlined a six-part typology of groups/individuals that engender what I call “agential risks,” which are defined as follows:

Agential risk: the risk posed by any agent who could initiate an existential catastrophe in the presence of sufficiently powerful dual-use technologies either on purpose or by accident.92

Not all of the six agential risk types are germane to the present discussion, since this discussion is limited to the particular existential risk of human extinction (see section 4 for additional scenarios outlined by Bostrom ). These are the three agential risk types that are relevant: 93

(1) Omnicidal ecoterrorists, or individuals who believe that the biosphere, or Gaian system, would be better off if humans were to disappear entirely.

(2) Omnicidal ethicists, or individuals who believe that humanity should go extinct for moral reasons and that this should happen involuntarily (“pro-mortalism”).

(3) Omnicidal idiosyncratic actors, a catch-all category that subsumes individuals who harbor a death wish for humanity for idiosyncratic reasons, which might arise from sadistic, anti-humanist, misanthropic, etc. proclivities.

Although no scientific surveys have yet been conducted to assess the prevalence of omnicidal ideologies in society (such surveys would likely encounter the problem known as “Lizardman’s Constant” ), I have elsewhere catalogued a number of historical groups and individuals who almost 94 certainly would have brought about human extinction if only the means had been available.95 Convincing the reader of this point goes beyond the scope of this paper; I will thus refer them to previous work. For the nonce, I will proceed on the assumption that a nontrivial number of omnicidal agents exist in the world—that is to say, while the percentage of the global population with omnicidal urges is quite small, the absolute number is worrisomely large. This fact is enough to take the issue seriously, since as John Sotos calculates, the probability of any single individual successfully causing human extinction need be only minuscule for this to accumulate over space and time to more or less guarantee doom on timescales relevant to contemporary civilization. More 96 specifically, Sotos shows that a 1-in-100 chance of only a few hundred agents releasing a speciesdestroying pathogen yields virtually certain doom within just 100 years or so.97

#### Unregulated nanotech risks extinction.

Behreandt 22 (Dennis Behreandt, MA from St. Norbert’s College, BA from Ripon College, cites Luis Del Monte, Award-winning physicist, author of *Nanoweapons: A Growing Threat to Humanity*, CEO of Del Monte & Associates, Inc.,; “Nanotechnology: A Double-Edged Sword;” 01-31-22, The New American, Vol. 38, No. 02, <https://thenewamerican.com/nanotechnology-a-double-edged-sword/>, TM) [language modified, denoted by brackets]

“Gray goo” is not a current threat, and likely won’t be, at least for the near-term future. More likely is that nanotech innovations could be used for evil purposes. “Unfortunately, as with nuclear technology, it is far easier to create destructive uses for nanotechnology than constructive ones,” wrote famed computing pioneer and Sun Microsystems co-founder Bill Joy in a now-famous essay for Wired magazine in April 2000. In that essay, titled “Why the Future Doesn’t Need Us,” Joy wrote, “Nanotechnology has clear military and terrorist uses, and you [can] ~~need not be suicidal to~~ release a massively destructive nanotechnological device — such devices can be built to be selectively destructive, affecting, for example, only a certain geographical area or a group of people who are genetically distinct.”

Scientists and researchers concerned with “existential risks” continue to point to nanotechnology as one innovation that poses distinctly significant threats to the survival of human civilization.

Physicist and author Luis Del Monte, who reports he was previously “a Honeywell Executive Director,” states that during his career “he led hundreds of physicists, engineers, and technology professionals engaged in micro to nanotechnology development for the Department of Defense (DoD) and commercial applications.” In 2017 he authored the book Nanoweapons: A Growing Threat to Humanity.

According to Del Monte, the first “singularity” of the sort envisioned by Ray Kurzweil — when general AI exceeds human cognitive capabilities — will lead to a second singularity involving self-replicating nanobots. Writing for HuffPost in 2017, Del Monte argued, “Given the strong symbiotic relationship between computer power and nanotechnology, we may see both technologies progressing faster than their historical trends. My rationale is that an advance in one technology fosters advances in the other.” He continued, “I judge this synergy may accelerate the advancement of both technologies.”

On his own website, Del Monte described what he foresaw as the outcome of the development of self-replicating nanobots. His vision differs from Drexler’s gray goo (which Drexler in recent years has backed away from a bit), but is likely more realistic.

“Self-replicating nanobots are the ultimate invention,” Del Monte said, pointing out that they would help solve problems on one hand, while proving extremely dangerous on the other. “In medicine,” he pointed out, “they will flow through our blood preventing diseases and curing injuries. In military applications, they will have the capability to completely destroy an adversary, from its populace to its structures.”

Unfortunately, he noted, nanobots could escape control, presenting considerable risks as artificial analogues to biological microbes such as bacteria and viruses. More complex biological systems, including mammals such as humans, have developed sophisticated immune systems in parallel with the existence of biological pathogens, and thus have an innate ability to protect themselves — if not always successfully — from them. There would be no such protection from artificial microbes — nanobots — if they escaped control.

Enter the extra-factual: In Total Recall, the blockbuster film adaptation of the Philip K. Dick short story We Can Remember It for You Wholesale, a future technology was used to implant realistic memories into the human mind. With nanotechnologies such as those being explored by several DARPA-funded labs, such a future might not be far off.

“Strategic nanoweapons, like their nuclear counterparts, pose a threat to humanity,” Del Monte argues. “The major issue is control. Will we be able to deploy strategic nanoweapons and maintain control over them? If, for example, we lost control of self-replicating nanobots, we would face a technological plague, one that we currently have no way of stopping.”

Nanotechnology is used widely today in many diverse applications, and continuing research promises near-term future innovation resulting in outcomes likely to be similar to forecasts from early innovators and researchers in the technology. Tied directly to AI and enabled by advanced 5G communications technologies, nanotechnologies are both a boon and a danger to mankind. While they will allow fabulous advances — especially in medicine and in materials science — they also have direct application to reality-distorting and reality-obliterating outcomes such as the metaverse plan outlined by Facebook.

#### Unregulated AI risks extinction---defense doesn’t assume interactions of multiple simultaneous threats

Pamlin, 15 -- Dennis Pamlin, Executive Project Manager of the Global Risks Global Challenges Foundation, and Stuart Armstrong, James Martin Research Fellow at the Future of Humanity Institute of the Oxford Martin School at University of Oxford, Global Challenges Foundation, February, http://globalchallenges.org/wp-content/uploads/12-Risks-with-infinite-impact.pdf

If a safe artificial intelligence is developed, this provides a great resource for improving outcomes and mitigating all types of risk.585 Artificial intelligence risks worsening nanotechnology risks, by allowing nanomachines and weapons to be designed with intelligence and without centralised control, overcoming the main potential weaknesses of these machines586 by putting planning abilities on the other side. Conversely, nanotechnology abilities worsen artificial intelligence risk, by giving AI extra tools which it could use for developing its power base.587 Nanotechnology and synthetic biology could allow the efficient creation of vaccines and other tools to combat global pandemics.588 Nanotechnology’s increased industrial capacity could allow the creation of large amounts of efficient solar panels to combat climate change, or even potentially the efficient scrubbing of CO2 from the atmosphere.589 Nanotechnology and synthetic biology are sufficiently closely related 590 (both dealing with properties on an atomic scale) for methods developed in one to be ported over to the other, potentially worsening the other risk. They are sufficiently distinct though (a mainly technological versus a mainly biological approach) for countermeasures in one domain not necessarily to be of help in the other. Uncontrolled or malicious synthetic pathogens could wreak great damage on the ecosystem; conversely, controlled and benevolent synthetic creations could act to improve and heal current ecological damage.

#### Scenario 2 is Privacy:

#### Effective state experimentation is vital to privacy, secure development of IOT, and cybersecurity – under or over regulation causes existential threats

McNabb 18 [Joanne McNabb formerly Director of Privacy Education and Policy in the California Attorney General’s Office, Certified Information Privacy Professional, with specializations in Government and Information Technology, a Fellow of the Ponemon Institute, a research center on privacy, data protection and information security policy, and a member of the Consumer Interest Forum of the American National Standards Institute. 4-5-2018 https://tcf.org/content/report/can-laboratories-democracy-innovate-way-privacy-protection/]

Today more data—our data, data about us—is in more hands, being used for more purposes than ever before. The Internet economy is fueled by personal information, yet it is largely a black box, whose inputs and outputs are not understood by most individuals or even regulators. One thing we do understand is that organizations that collect other people’s information—online retailers and apps, banks, credit bureaus and even government agencies—often have a hard time keeping a tight grip on it, as evidenced by a steady stream of data breaches.The TJX breach of the credit card numbers of 94 million customers in 2006, Anthem’s breach of the medical information of 79 million in 2015, and the massive Equifax breach reported in 2017 that exposed Social Security numbers, driver’s license numbers, and other sensitive information of over 143 million Americans are just a few of the larger data breaches in recent years.1

Where is all this data coming from? Companies and other organizations are collecting information not only from our visits to websites and our use of mobile apps, along with our travels through the world using credit cards and passing video cameras, but also from inside our very own homes. Smart appliances, burglar alarms, utility meters, and a burgeoning market of connected consumer devices—even toys in the hands of our children2—are collecting data from us and about us: where we are and where we’ve been, whom we’re with or near, what we’re doing, waking or sleeping, around the clock, seven days a week. We’re becoming nodes in the network of everything, with increasingly less ability to disconnect.

The recent Facebook–Cambridge Analytica incident raises many issues about the use of this very personal data in the marketplace. Reporters are still attempting to untangle the web of players who extracted and used the personal data of more than 87 million, and potentially all, Facebook users.3 Among the concerns articulated in news reports are the effectiveness of terms of service, whether the incident constitutes a data breach, and the ethics of online political manipulation. More important—and less talked about—the incident reveals a lack in the United States of legal standards for data privacy as a fundamental human right.

Neither the market nor the law is working to protect privacy in our world of Big Data and complex data flows. In fact, the legal framework to protect privacy in the United States is flimsy and has been outpaced and outdated by technological developments. At the same time, the federal government is actually scaling back regulatory and enforcement actions regarding privacy, as on other consumer protection and civil liberties issues.

In the face of this federal retrenchment, states can and should step up their legislative efforts to protect privacy. The advent of a new privacy regulation in the European Union provides an opportunity for states to “harmonize” or modify key state privacy laws to align better with the standards that most companies that do business online will soon have to meet for their European customers.

Big Data and Its Harms

We live in an increasingly connected and data-driven world. Last year, the market intelligence company IDC forecast that by 2025, the global datasphere of all digital data created will grow to 163 zettabytes, a tenfold increase over the 2016 volume.4 (A zettabyte is 1021 bytes. If everyone in the United States took a digital photo every second of every day for over a month, all of those photos together would amount to about one zettabyte.5)

It’s not just the volume of data collected and stored that makes Big Data big, it’s also the capacity to do things with the data—Big Analytics. Big Analytics visionaries believe that the analysis of large volumes of formerly unavailable data holds the promise of providing new insights into and solutions for individual and societal problems, from personalized medicine to improved energy efficiency, detecting the dispersion of infectious diseases and more effective policing.6

We are part of the datasphere. Over half the world’s population was connected to the Internet in 2017, and estimates for 2025 put the figure at 75 percent.7 And our digital dossiers are growing. From online searches on a PC or mobile phone, to using a GPS in a car, being recorded by an ATM video camera, and heart rate monitoring by a fitness wearable, the average person is estimated to have experienced 218 data-driven interactions per day in 2016, a number projected to increase to nearly 5,000 transactions per day by 2025.8

Dataism

In 2008, Chris Anderson, then-editor of Wired, wrote an article articulating a viewpoint that has come to be called Dataism. Anderson asserted that data had supplanted the scientific method:

This is a world where massive amounts of data and applied mathematics replace every other tool that might be brought to bear. Out with every theory of human behavior, from linguistics to sociology. Forget taxonomy, ontology, and psychology. Who knows why people do what they do? The point is they do it, and we can track and measure it with unprecedented fidelity. With enough data, the numbers speak for themselves.9

Do numbers speak for themselves? Is the invisible hand of dataflow a panacea for all individual and societal ills? There is no doubt that data is transforming our lives, but this phenomenon is taking place in an environment of uncertainty and rapid technological change, and so decisions on how our data can be used has implications for our future. We need to ensure that Big Data works for us, not just on us.

Behind the Electronic Curtain

The basic Internet business model today is to collect all possible information from and about individual users and monetize that data for use in targeting ads at the individual level. Just how this happens is largely invisible to consumers, who are unaware of evolving browser tools and technologies that enable companies to track an individual’s activities across multiple devices such as smartphones, tablets, desktop computers, and other connected devices, and even link that data with offline activities such as purchases in brick-and-mortar stores and information in public records.

One of the touted benefits of data-driven online businesses is that they can deliver personalized content. With the power of Big Analytics, websites and companies can target consumers with content designed to appeal to them, based on their interests as inferred from captured data streams. Of course, the prime objective of this expansive collection of personal information and employment of sophisticated algorithms is profit from targeted advertising. Targeted, data-based advertising is more effective—generates more clicks and sales—than advertising addressed to broad demographic categories of viewers.10

Privacy Harms

Consumers vaguely understand that being inundated with advertisements online is the price of “free” access to the Internet’s trove of information and services, but most are not happy about this deal. In a nationwide survey of adults conducted online by the National Cyber Security Alliance, respondents ranked concern about not knowing how their personal information is being collected or used higher than becoming a victim of crime or not being able to get health care. The same survey found 65 percent of Americans somewhat or strongly agreed that they are not able to control how their information is used or shared online, and two-thirds would accept less personalized content, including fewer discounts, in order to keep their personal information private.11

While some individuals may view advertising “personalized” for them as of more interest or less annoying than non-targeted ads, there are also privacy harms resulting from the use of personal information in this way. Someone who has been followed around the web by an ad for a pair of shoes or Viagra or another product previously clicked on may experience a certain level of discomfort or anxiety from realizing he or she is being surveilled; this is one type of intangible privacy harm.12 Someone who receives ads based on a medical condition revealed by online searches may feel very uncomfortable indeed.

Such concern is not unjustified. Businesses know about all our online activities, but we remain in the dark about what information they’re collecting, what they’re inferring from it, and what they’re doing with it. The results of this information asymmetry can be tangible as well as subjective. Mathematician Cathy O’Neill, author of Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy, warns that companies are using data to direct people to certain goods and services and to offer prices based on how much they think an individual can pay: “Travel sites show fancier hotels to Mac users, auto insurance companies charge more to customers who are less likely to comparison shop, payday lenders focus on people whose search queries show signs of desperation.”13

O’Neil and other researchers also describe the use of secret algorithms to profile and sort individuals into groups based on weaknesses and vulnerabilities identified by their online activities. These individuals may then be targeted with predatory ads for for-profit colleges or payday loans.14 In 2016, the California Attorney General won a $1.1 billion judgment against Corinthian Colleges for their predatory and unlawful practices. The complaint included Corinthian’s practice of targeting a low-income demographic which it describes in internal company documents as composed of “isolated,” “impatient” individuals with “low self-esteem,” who have “few people in their lives who care about them” and who are “stuck” and “unable to see and plan well for future,” through aggressive and persistent internet and telemarketing campaigns and through television ads on daytime shows like Jerry Springer and Maury Povich.15

Big Data can also be used by websites to steer consumers to particular products or to set prices based on their inferred willingness or ability to pay, in ways that can be unfair or even discriminatory. In 2012, a Wall Street Journal investigation found that the Staples website set different prices based on what it inferred to be the user’s location.16 Legal scholar Ryan Calo has written about the power of digital market manipulation, the result of information asymmetry, where companies are able reach out to consumers even before they come to market and use what they know about individuals to take advantage of their vulnerabilities.17

Even when we think we are anonymous online—when we haven’t registered with a website for example—we likely are not. The sheer volume of data coming in from different sources makes it possible to link individual data to specific people, even when some datasets have been intentionally de-identified by removing key elements such as names or Social Security numbers. One example of the process of re-identification was reported by Professor Latanya Sweeney of Harvard. She purchased de-identified hospital discharge data from the State of Washington and was able to correlate that dataset with newspaper accounts of accidents in the same time period. She was able to re-identify 43 percent of a sample of 81 accident victims in the hospital discharge data by matching fields common to both sources. Sweeney also noted that predictive analytic companies were big buyers of publicly available health data.18

In the service of commerce, the algorithms of Big Analytics are increasingly exposing and monetizing some of the most intimate aspects of our lives—details about our health, who we know, what we think, what we do in the privacy of our homes. In the midst of this assault, how do various privacy laws in the United States and abroad attempt to address these invasive practices?

Privacy Law and Market Failure

The majority of nations protect privacy as a fundamental human right, but the U.S. Constitution does not provide an express guarantee of privacy.19 Privacy rights in our Constitution are “penumbral”; that is, they are implied by the Bill of Rights rather than explicitly stated. For example, privacy in speech, reading, and association is seen as being protected by the First Amendment, and the privacy of the home against quartering soldiers and unreasonable search and seizure by the Third and Fourth Amendments. Notably, these individual rights are only protected against government action, not against infringing actions of businesses or other organizations.20

The United States also differs from other developed countries in Europe, Asia, and the Americas in its statutory law on privacy. Many other countries have comprehensive privacy laws, but the United States does not. Since the 1990s, the federal government has avoided enacting broad privacy laws and instead relied on market mechanisms, notably the failed notice-and-choice regime to regulate the Internet and its related businesses.21 (As will be discussed later, “notice and choice” is the practice whereby a website or app notifies consumers of its privacy practices with a posted “privacy policy” statement, and consumers then have some degree of choice about the terms offered.)

Federal privacy law, where it does exist, is narrowly sectoral. It is made up of statutes, regulations, and judicial decisions that apply only to certain industries (such as finance, or health care) or certain types of data (such as children’s data, drivers’ records, video rental data). In the absence of specific privacy laws, the default in the United States is that when it comes to flows of information, the free market prevails, including the market for personal information.

By contrast, the EU considers privacy as a human right essential to the respect for human dignity. In the European Conventions of Human Rights of 1950, privacy is addressed as the “right to respect for private and family life.” Similarly, in the EU Charter of Fundamental Rights in 2000, privacy is conceived as respect for private and family life, the home and communications, as well as the protection of personal data. This right is implemented in comprehensive privacy laws intended to protect the rights of individuals over their own personal data. The default in the EU is that personal data should not be processed (that is, collected, stored, used, and so on). Any data processing that does take place must meet standards of transparency, legitimate purpose, and proportionality.22

An update of EU privacy law, which will take effect on May 25, 2018, seeks to strengthen and harmonize the law across all member nations. The General Data Protection Regulation (GDPR) creates new individual privacy rights and extends its application to companies that process personal data about EU individuals, even when a company is not located in the EU. The new privacy rights include the “right to be forgotten” (have one’s personal data erased in certain situations), data access and rectification (access to or a copy of one’s own personal data and correction of inaccuracies) and data portability (transfer one’s personal data from one company or platform to another).23

While the EU approach has been criticized by some as overly rule-bound, resulting in companies in some countries focusing more on paper compliance than on practical privacy practices,24 it has often proven more effective in protecting data privacy than the U.S. approach of light-touch regulation and reliance on market forces.

Regulatory Failure: Unnoticeable Notice and Illusory Choice

The foundational principles of data privacy law are actually U.S. in origin, first formulated in 1973 by the U.S. Department of Health, Education, and Welfare in its Fair Information Practice Principles (FIPPs).25 The FIPPs were then expanded and codified by the Organisation for Economic Co-operation and Development (OECD) in 1980, with the agreement of member countries, including the United States. Intended to support the control of individuals over their own personal data in the hands of organizations, the FIPPs form the basis of many modern international privacy agreements and national laws. The eight FIPPs in the OECD version are Collection Limitation, Data Quality, Purpose Specification, Use Limitation, Security Safeguards, Openness or Transparency, Individual Participation, and Accountability.26 In most U.S. privacy law, these eight principles have devolved to just two, which have come to be called Notice (Openness or Transparency) and Choice (Use Limitation). A company notifies consumers of its policies and practices regarding personal information, and then consumers choose whether or not to accept the terms. The failure of this approach is evident, both in the privacy notices that are difficult to notice and understand, and in the choices that are illusory. In a best practices guide on crafting meaningful privacy policies, the Office of the California Attorney General described their current shortcomings: Dissatisfaction with the effectiveness of privacy policy statements has grown over time. As the use of personal information in commerce has expanded in scope and complexity, comprehensive privacy policy statements have tended to become lengthier and more legalistic in style, yet often fail to address data handling practices of concern to consumers or offer them meaningful choices about the collection and use of their data. The typical policy’s ineffectiveness as a consumer communication tool has been borne out by research findings that consumers do not understand, and many do not even read, the privacy policies on the web sites they visit. 27 Where they are available, privacy policies usually fail to address critical issues, such as what a company does with the personal information it collects, what entities it shares the information with, what those entities do with it, and how long the information is retained. The choices offered to consumers regarding the collection and use of their personal information generally boil down to take it or leave it, all or nothing. That is, all too often, the only choice consumers are given is either to accept a company’s privacy policy, however unsatisfactory it may be, or decline to use their product. If any specific choice is offered, it tends to be the choice to opt out of allowing the company to share the consumer’s personal information with other companies for use in marketing. But the default is to let companies share the data. Since the consumer is unlikely to have read the policy providing this choice and thus likely to fail to opt out, this lack of action is regarded as consent to sharing of the data. Furthermore, some websites and apps start collecting information the moment a user lands on the site or opens the app, before privacy policy notifications have even been given.

Moving Beyond Notice and Choice

One approach to a new privacy framework beyond unnoticeable notice and illusory choice is to offer consumers a full, robust spectrum of privacy settings to choose from, rather than the all-or-nothing approach. Such a framework would be based on three elements: more privacy choices, default to privacy, and a reasonable standard of care for data. More choices means offering consumers gradations of choice, options between all and nothing. For example, consumers now sometimes have choices about the geolocation information collected by their mobile devices: (1) allowing an app no access to geolocation, (2) allowing access only when the app is being used, or (3) allowing the app to access geolocation data at all times. Rather than simply offering option 3 or nothing, this policy would mean providing additional options as well. Default to privacy means calibrating default settings to limit the collection of personal information. Even when an online service provides a privacy policy, it generally comes too late; only after our information has been collected are we able to learn about it. This “grab it first, explain later” approach seems unfair in the growing network of sensors that are collecting information on us as we move through our neighborhoods and even inside our own homes. A better architecture for choice is to set privacy-respectful defaults and give the user the choice to change the setting. This type of architecture not only gives consumers more real control, but also serves as an incentive for companies to provide a privacy notice that is easier to find and easier to understand than we generally see today. Data security is an essential condition for privacy protection: we can’t have privacy without it. The Internet of Things is increasing the volume of data collected and stored, and daily reports of data breaches have made us all aware of the challenges of securing information and of the costs of failing to do so. A clear articulation of a reasonable standard of care for data, based on existing laws, jurisprudence, and technical standards, would go a long way to define at least a basic level of security. Such a framework could inform efforts to update U.S. privacy laws, to move beyond mere notice and choice.

Market Failure: IoT Insecurity

Security guru Bruce Schneier is among many who have called the insecurity of the Internet of Things (IoT) a market failure, with no market solution, because the insecurity is to a large extent an externality, affecting neither buyers nor sellers but other people.28 Of course, an insecure device can also be turned against the consumer who purchased it, who was focusing on price and features rather than on security.

This is a vitally important matter for privacy (security is a necessary component of privacy) and for cybersecurity. The insecurity of the Internet of Things—made up of smart TVs and toys, electric meters and thermostats, webcams and alarm systems, fitness wearables and smart watches—imperils not just individuals’ personal information, but puts their health and safety and that of society as a whole at risk.

The IoT is also one of the sources contributing to the phenomenal growth of the datasphere. The number of Internet-connected devices has been increasing rapidly in recent years. In early 2017, Gartner, the IT research and advisory firm, estimated that the number of devices would surpass global population that year, with 8.4 billion connected devices for 7.6 billion people. Other estimates put the number of devices even higher, forecasting as many as 20 billion of them by 2025.29

Connected devices are used in business and industry, on streets and highways and in public buildings. But the biggest component of the IoT is consumer devices, connected things in our homes, our cars, and on—or even in—our bodies. These billions of things are collecting and transmitting information in a space traditionally regarded as private and protected. The interaction of all these devices with each other and with the companies that sell them and those that carry their data is making our home networks ever more complex. And we may not realize it, but we are in the position of being the chief information officer (and the chief information security officer and chief privacy officer) of our own networks, a responsibility for which few of us are equipped.

The IoT has significant privacy implications. For example, smart meters collect data about gas and electricity consumption at the household level that can reveal information about activities in the home, including when residents are away and whether the home has an alarm system and how often it is activated.

Siemens in Europe has summarized the privacy threat represented by the smart grid: “We, Siemens, have the technology to record it (energy consumption) every minute, second, microsecond, more or less live. From that we can infer how many people are in the house, what they do, whether they’re upstairs, downstairs, do you have a dog, when do you habitually get up, when did you get up this morning, when do you have a shower: masses of private data.”30

Medical devices and other connected wearables collect very sensitive information, which raises questions of who is getting this data, and what they are doing with it.31 Smart toys, digital personal assistants, TVs and other devices that use speech recognition may record and store conversations in our homes, including those with guests who are unlikely to have consented, even if we passively and unknowingly have.

IoT devices have user interface constraints that make it difficult or impossible to provide notice of privacy practices, consumer choices or controls. Imagine trying to find or read a privacy notice on a router or a smart appliance. Furthermore, the companies that make these devices tend to lack experience with privacy and security. In summer 2017, the possibility that the makers of Roomba, the robot vacuum, would share the floor plans the device makes of the homes its device cleans made headlines. The public reaction led the company to speak to privacy issues, ultimately saying that they would not share data with third parties without the informed consent of customers. Exactly how they might advise consumers of the possibility and get their consent was not disclosed.32

The privacy concerns related to the IoT are not insubstantial, but it is their insecurity that imperils individuals’ health and safety and puts our society as a whole at risk. The Homeland episode in which the vice president is killed by a hacker who remotely manipulates his pacemaker is not pure fiction. In recent years, medical device manufacturers have become aware of security bugs in pacemakers, defibrillators, and insulin pumps. In October 2016, Johnson & Johnson warned patients of security vulnerability in one of its insulin pumps that a hacker could exploit to cause patients to receive a dangerous overdose of insulin.33

Another danger of insecure IoT devices was demonstrated in 2016 by the spread of the Mirai malware that took down websites and entire networks in fall 2016. The large-scale attack was carried out by a botnet of enslaved consumer devices: insecure security cameras, routers, and DVRs whose owners were unware that their devices were responsible for spreading the malware.34

Botnets of insecure IoT devices have the potential to put vast computing power at the disposal of criminals and nation states. The financial services sector, a target because that’s where the money is, recognizes IoT as a top vector for cyber-security attacks.35 The IoT weak link poses a similar threat to other sectors, including the hydroelectric power industry. The vulnerability of the sector to cyberattacks was made public in a March 2016 indictment by U.S. Attorney General Loretta Lynch of Iranian-government-sponsored hackers who were able to penetrate the controls of a small New York dam. The indictment also charges the same Iranian hackers with cyberattacks on major U.S. banks.36

As Schneier explains, the manufacturers of IoT devices have neither the expertise nor the financial incentives to make their products more secure. They are designed and built for features and low price, not for security. And unlike other computer hardware, these devices are not configured to receive updates with security patches. We update our phones and computers by installing patches and we replace them every few years. This is not the case with DVRs, or connected TVs, thermostats, or other appliances; we replace them at much longer intervals. The only feasible way to update most IoT devices is to toss them and buy a new model.

We know what the vulnerabilities of IoT devices are and how they can be addressed. A report published by the Broadband Internet Technical Advisory Group (BITAG) in November of 2016, in the wake of the Mirai botnet, outlined the privacy and security improvements needed to prevent the devices from allowing unauthorized users to take them over, mount cyberattacks, conduct surveillance and monitoring, induce device or system failures, leak data, and harass authorized users.37

It’s not that we don’t know what to do; it’s that the market isn’t letting it happen.

Big Tech and Federal Retrenchment

As discussed above, evidence of the failures of the law and the market to protect privacy abound. The speed of technological evolution outpaces and outdates the law, and the role of the tech industry in resisting efforts to update the law has become significant. In recent years, the tech industry has been active in Washington and increasingly in state legislatures, and has had considerable success in defeating stronger privacy legislation on the grounds that it will stifle innovation.38 For example, in California last year, the tech industry mounted a vigorous campaign that successfully stalled, if it did not quite kill, a privacy bill for Internet service providers (ISPs) that would provide for more effective notice and more meaningful choice.39

The Electronic Communications Privacy Act (ECPA) is a prime example of a law that has been rendered inconsistent and irrational by technological developments. Enacted in 1986, before the Web, the Cloud, and social media existed, ECPA now gives government very broad access to online communications stored on third-party servers, as opposed to, say, private storage devices in an individual’s home. This result is inconsistent with ECPA’s original purpose of achieving “a fair balance between the privacy expectations of citizens and the legitimate needs of law enforcement”; updating the ECPA so that it more closely strikes that balance has been the goal of privacy advocates and tech companies for years.40 Unfortunately, these efforts have been unsuccessful to date, with opposition coming both from law enforcement and from civil agencies.41

Data security, an essential component of privacy protection, is another issue on which industry opposition has long stymied Congressional action. In spite of years of well-publicized data breaches, Congress has not been able to pass legislation setting data security standards for companies that handle personal information. Not only were such proposals opposed by industry, but the Chamber of Commerce resisted even a voluntary program of cybersecurity for critical infrastructure companies developed in response to Executive Order 13636 by President Obama, arguing against any new regulatory regime.42

While Congress has remained gridlocked on addressing the shortcomings in U.S. privacy law, the Trump Administration has been pursuing retrenchment, rolling back existing privacy regulations and reining in enforcement agencies.

The most obvious move to date is the repeal of the broadband privacy rule, which imposed privacy obligations on broadband Internet access service providers (commonly known as ISPs). The rule was adopted by the Federal Communications Commission (FCC) in 2016. Urged by the newly installed FCC chair, Ajit Pai, Congress invoked the Congressional Review Act to hurriedly pass S.J. Res. 34 in March 2017, overturning the broadband privacy rule before it had taken full effect. The repeal also prohibited the FCC from introducing similar rules in the future.

The FCC had adopted the broadband privacy rule after a long battle between cable, telecom, and other technology companies on the one hand, and consumer privacy and civil liberties advocates on the other. The FCC held public hearings and published a draft version that received public comments for six months. The hasty action to nullify the rule, under cover of Congress’s effort to repeal the Affordable Care Act, contrasts strongly with the public deliberation accorded its passage.43

This action was a serious blow to privacy protection. The broadband privacy rule recognized the privileged position ISPs hold as gatekeepers to the Internet, a position that provides them with a broad and deep view into every aspect of their customers’ online activities. The rule outlined a reasonable privacy regime to give individuals strong data security protections and more control over the use of their personal information by their ISPs. As noted in comments from the California Attorney General,

the privacy rule responds to this situation by providing privacy-respectful defaults and more effective user-centric privacy notices, which together enable meaningful customer choices. The schema for customer choice in the proposed rule is based on alignment with customer expectations, with the greatest control granted for uses of customer [personal information] that are not required for the provision of the broadband service and are thus likely to be unexpected by the customer.44

States Can Lead the Way

In the face of inaction and retrenchment at the federal level, can we look to the states to move the ball on privacy? States have been the source of numerous privacy innovations in past years, including laws on identity theft victim rights, data breach notification, limitations on the use of Social Security numbers, cell phone data privacy, cybersecurity, and cyber-exploitation (sometimes known as “revenge porn”). States have served as laboratories in the privacy arena, with legislative innovations that originated in one state often being picked up in other states and sometimes—as in cases of identity theft victim rights, Social Security number restrictions, and data breach notification—in federal laws or regulations.

The new regulatory development occurring in the EU provides an opportunity for states to rebuff the industry critique of state privacy regulation as a patchwork and instead work to harmonize state privacy laws upward. When it takes effect in May 2018, the GDPR will apply not only to any companies based in Europe, but also to many U.S. companies that do business online that results in their collecting, processing, or maintaining information on European residents. With penalties for violation of up to 4 percent of global gross revenues, the GDPR is being taken seriously by U.S. companies.45 As it turns out, the policies and procedures these companies are implementing to protect their European customers and employees can also benefit Americans as well—provided action is taken.

This report does not propose a comprehensive federal privacy law similar to that in the EU. Nor does it propose a new quasi-self-regulatory approach, such as the “information fiduciaries” concept described by Yale law professor Jack M. Balkin and Harvard law professor Jonathan Zittrain. They propose that companies could choose to be governed by a set of privacy practices based on the FIPPs in exchange for exemption from state privacy laws preempted by the federal government.46 Either of these approaches would require significant legislative action at the federal level, which is highly unlikely in the present environment.

Rather, this report recommends that states continue to be innovative in privacy law, crafting legislation with an eye to taking advantage of the GDPR’s requirements to enact stronger state privacy protections. Such an approach could result in a degree of “harmonization upward,” ensuring that proposed legislation provides a level of privacy protection roughly equivalent to that of the GDPR. While this would not constitute a total harmonization—that is, it would not replace tenets of existing U.S. state laws with the rules embodied in the GDPR—it would have the advantage sought in many harmonization efforts of simplifying compliance for any businesses that are subject to EU regulation.

Among the most pressing privacy issues needing to be addressed are broadband privacy, IoT insecurity, and the need for interstate harmonization of data breach notification laws.

Broadband Privacy

Since the repeal of the FCC’s broadband privacy rule in late 2017, nearly half the states have introduced legislation to fill the void, according to the National Conference of State Legislatures.47 Several of the pending bills are patterned generally after the FCC rule, aiming to provide the same level of protection for the broad swath of personal information available to ISPs.48 They would require ISPs to get the consent of their customers before disclosing or selling personal information. States should craft legislation that, rather than seeking the same level of consent for all customer information, should adopt the tiered approach to consent found in the now-repealed FCC rule. Customers should be given greater control over sensitive information, such as precise geolocation, financial and health information, web browsing and app usage history; the use or sharing of this type of information should require the affirmative, opt-in consent of the customer. The use or sharing of non-sensitive personal information, such as email address and type of service, should be allowed, unless the customer says no and opts out. And exceptions should be made for the use of information necessary for providing the contracted service and certain other emergency situations. While this degree of individual control is not currently provided by most U.S. privacy laws, the central and privileged position of ISPs certainly justifies moving in this direction. In other countries, individuals are afforded more control over their own personal information. The GDPR sets a very high standard for consent to the processing of personal data. An individual’s consent must be “freely given, specific, informed and unambiguous” and a clear affirmative action is required.49 The requirements of the former FCC rule regarding the contents of the notice describing the choices available to customers and for the mechanism by which customers can exercise or revoke their choices went a long way to providing for meaningful consent approaching the GDPR level. State broadband privacy laws should incorporate the consent provisions that had been part of the FCC rule. This approach is in line with the new privacy framework outlined above, providing consumers with more choices and setting privacy-respectful defaults.

Securing the IoT

Cybersecurity has been a hot topic in Congress for a number of years, with ever-larger data breaches keeping it on the front burner, but numerous efforts to enact broadly applicable cybersecurity legislation have failed. There have also been some congressional hearings and legislative proposals for cybersecurity for the IoT. Even though the attack of the Mirai botnet of consumer devices increased policy makers’ awareness of the problem, it remains unlikely that Congress will act anytime soon. And the threat that this insecure attack vector poses continues to grow with the increase in the number of connected devices. This is an issue on which states might innovate, looking for legislative approaches to correct the market failure by setting minimum security requirements for connected devices. Legislation might narrow the focus to consumer devices, those intended for “personal, family or household purposes,” in the language of laws regulating consumer products and services. This would exclude IoT used in business, industry, and government, where organizations have far greater resources and expertise to address the security issues than do consumers on their own. A narrower focus would also somewhat reduce the political burden of passing the legislation. Legislation might look to the BITAG report discussed above, which outlines the major security vulnerabilities and recommends current best practices for securing IoT devices. The report’s recommendations include the following: ensure that devices have a mechanism for automated secure software updates, a capability that does not currently exist for most IoT devices; use strong authentication by default, to prevent unauthorized parties from accessing devices or changing their code or configuration; test and harden all possible device configurations, not just the default configuration, to ensure that any customization by consumers is secure; and protect data with security and cryptography best practices, to protect against data leaks both from the cloud and between devices.50 These requirements would constitute privacy defaults and an appropriate standard of care for data, components of the new privacy framework discussed above. The GDPR might also be consulted on this issue. One of its requirements is data protection by design and default, whereby companies must consider data protection at the outset, when designing systems for processing personal data.51 The data security requirement in the GDPR would also be relevant. It is risk-based: organizations must implement appropriate technical and administrative measures to ensure a level of security appropriate to the risk.52

Harmonizing State Data Breach Notification Laws

One of the most innovative and influential privacy laws originated in a state. In 2003, California enacted the first law requiring organizations to notify individuals of a security breach of personal information. The law made an economic adjustment, shifting most of the burden and cost of data insecurity from individual data subjects to the organizations responsible for it. In addition to alerting individuals that their information is at risk so that they can take defensive action, breach notification requirements have provided an incentive for companies and other organizations to pay attention to and devote resources to data security and privacy. California’s law was followed by similar laws in forty-seven other states, as well as federal regulations and guidelines for health care entities and financial institutions.53 It has also been taken up by other countries, and will be a requirement of the impending GDPR.54 Urged by industry complaints about the compliance burden created by multiple laws, Congress has attempted for over a decade to pass a federal data breach notification law that would preempt state laws. In addition to having an overly broad preemptive scope, some of these federal proposals would have negated not just state data breach laws, but also longstanding consumer protection provisions, and thus would have lowered the level of consumer protection and prevented further improvements. In the current situation, the protections of the strongest state laws—the highest common denominator—are generally afforded to the residents of all states in a multi-state breach. In the current situation, the protections of the strongest state laws—the highest common denominator—are generally afforded to the residents of all states in a multi-state breach. State data breach notification laws make a good candidate for harmonization across state jurisdictions, particularly as an alternative to federal preemption,55 because it would not be that difficult to simplify the pattern in the patchwork of state breach laws. State breach laws are in fact very similar, following in most respects the original California law.56 Like California’s, the other state laws require organizations to notify individuals when personal information is breached, prefer notification by mail but allow alternative “substitute notice” in some situations, permit a law enforcement delay, and offer an exemption from notification if the breached data is encrypted. The significant differences between state laws are in three provisions: (1) the notification trigger, (2) notification timing, and (3) the definition of covered information. This is where harmonization efforts should be directed. Such an effort by state policy makers could result in simplifying compliance while preserving consumer protection and other benefits of state regulation. Below is a proposal for approaching the harmonization of state breach laws, with the added benefit of aligning more closely with federal and European breach notification requirements.

Toward a Harmonic Convergence

On the important issue of the trigger for notification, the state laws take one of two approaches: over three quarters of the state laws have a harm trigger, requiring notification only if the breached entity judges that the incident poses a risk of harm to individuals; the others have an acquisition trigger, requiring notification if the data was acquired or reasonably believed to have been acquired by an unauthorized person. In a sense, both approaches are based on a risk of harm, with acquisition by an unauthorized person seen as constituting such a risk. These approaches could be harmonized by using an acquisition trigger and adding a presumption that the breached entity must notify when a breach of personal data has occurred—unless the entity finds through a risk assessment that the incident is very unlikely to result in harm to affected individuals. This would also necessitate reporting incidents to the state Attorney General or other government agency, as is currently required in over half the state laws, which would have the authority to review decisions not to notify. Setting a breach size threshold to trigger reporting to regulators—but not for notifying individuals—would help reviewing agencies to prioritize the deployment of their limited resources. Currently, over half of state breach laws set such a threshold, ranging from 250 to 500 individuals affected. This formulation of a notification trigger would also align with the Health Insurance Portability and Accountability Act (HIPAA) and the GDPR. Since 2009, HIPAA has required covered health care entities and their business associates to notify individuals in case of any impermissible use or disclosure of protected health information, unless the entity conducts a risk assessment and determines that there is a low probability that the information has been compromised. Similarly, the GDPR requires notification to individuals of a breach of personal data if the incident is determined to pose a high risk of harm to individual rights or freedoms. (The GDPR also requires notifying data protection authorities of breaches when there is any likelihood of harm to the rights or freedoms of individuals, even if the higher threshold for notifying individuals has not been reached.) The other factor in a harm-based trigger is the definition of harm, which should be left as a general term to allow for different types of harm posed by different types of personal data and by evolving technologies and business practices. While some states limit harm to identity theft or financial harm, the majority of the state laws with a harm trigger employ a broad concept, using the terms “harm” or “misuse of the data.” The GDPR also speaks broadly of “physical, material, or non-material damage,” including being deprived of control over personal data.57 Harmonizing state laws on the timing of notification should not be difficult. A harmonized law using a formula such as “in the most expedient time possible, without unreasonable delay” could explicitly allow time for securing the system and determining the scope of the breach and for conducting a risk assessment in order to determine whether notification is required. This would align with the GDPR, which requires notification of individuals “without undue delay” and allows time to assess the level of risk to individuals. While existing state laws do not provide for a risk assessment, essentially all of them do require notification “in the most expedient time possible” or “without unreasonable delay” and allow for time to secure the system and determine the scope of the breach. Nine states specify an outer limit of 30 to 90 days from discovery of the breach. Similarly, the HIPAA regulation requires notification “without unreasonable delay,” allowing up to 60 days. The problem with specifying an outside time limit is that it tends to become the norm. The flexibility of a “without unreasonable delay” standard encourages timely notification of very different incidents. What is considered a reasonable delay in the case of notifying of a breach involving a data owner and one or more contracted service providers and many data subjects whose contact information is not readily available would likely be considered an unreasonable delay in the case of a breach of a single system involving fewer data subjects. The pressure to notify promptly is felt by organizations, as they are faced with justifying the time they took to the public when the incident is reported in the news. Harmonizing on the definition of covered information for breach notification laws is more challenging. There is diversity among the states on this point. While all state breach notification laws have basic data types in common (name plus Social Security number, driver’s license number, or financial account number), after these, the picture becomes more complicated. A third of the state laws also include medical information, a third of the laws include biometric data, nearly a third include online account credentials, and the same number add other data elements (such as passport number, taxpayer ID number, mother’s maiden name).

More nimble than Congress, state legislatures have adapted the definition of personal information in breach notification laws to respond to changing circumstances affecting their residents. The original California law contemplated financial identity theft as the risk to be addressed by notification, and therefore limited the types of personal information covered to those sought by identity thieves. Five years later, with the burgeoning of medical privacy and medical identity theft, the definition was expanded to include medical and health insurance information. Two years later, the California law was amended again to add online account credentials to the definition of covered information, in response to the targeting of that data by criminal organizations. This evolution is an example of laboratories of innovation at work.

Allowing continuing updating of the law on this issue is important to keeping breach notification effective. Before adding new types of data, however, states would be wise to consider the purpose served by the law: transparency. While the requirement to notify serves as an incentive to organizations to improve their privacy and security practices, that is a secondary effect of the law. (An information security statute that prescribes specific security standards is another matter.) The authors of the original breach notification law stated that its intent was to give consumers early warning that their personal information was at risk of being abused, allowing them to take action to protect themselves.58 Bearing this purpose in mind, certain types of information might be excluded from or not added to the definition in the state laws, if knowing that it has been breached does not enable individuals to take defensive action.

Certainly differences in state breach laws can complicate compliance for companies that experience a breach affecting residents of many states. In response, charts and matrices of state breach laws have been developed and are readily available to assist in navigating the terrain.59 Smaller companies, such as medical and other professional practices and local merchants, often have personal data only on the residents of their state, and thus need comply with only a single law.

Conclusion

While the present political environment at the federal level is unlikely to produce a radical strengthening of data privacy law, there are privacy problems that should not await federal action at some unknown future date. The lack of privacy protections for the ISPs that have access to the broadest swath of our online activities, the insecurity of the IoT devices in our homes, and the possibility of companies gaining legal justification for hiding some breaches that put our data at risk of misuse are issues that state legislatures can address.

States have been responsible for some of the most innovative and effective privacy laws. Today, states have the opportunity to take advantage of a far-reaching European privacy law to enact laws requiring U.S. companies to provide their domestic customers and employees with at least some of the same privacy protections that they accord Europeans. Functioning as the laboratories of democracy that U.S. Supreme Court Justice Louis Brandeis envisioned, states can respond to changing conditions and evolving technologies with new approaches to privacy protection. They can also learn from each other, adopting provisions and laws that prove effective.

#### Secure IoT prevents pollinator collapse---extinction.

Tash Bandeira 20, Reporter at Ubibots, an Engineering Services Firm, “Saving the Bees with IoT”, Ubidots, 7/15/2020, https://ubidots.com/blog/saving-the-bees-with-iot/

Sometime in late 2006, beekeepers across North America started seeing drastically high losses among their western honey bee colonies. Less dramatic disappearances were also observed in Europe and around the world, causing significant losses in agricultural crops that depend on bee pollination to survive.

Now known as Colony Collapse Disorder (CCD), these sudden losses occur when most of a colony’s worker bees leave their queen and plenty of honey and pollen reserves behind. With few dead bees found nearby, the phenomena didn’t correspond to any previously known causes of bee death.

Without worker bees, hives die out and the repercussions go far beyond honey shortages. We see significant agricultural losses and accompanying economic effects worldwide. Approximately 75% of our food supply depends directly on honey bee pollination, which corresponds to a global worth of hundreds of billions of dollars. And with no end in sight for CCD, there’s a lot at stake in the bee crisis.

Scientists have yet to settle on a single cause for the decline - attributing it to a combination of pesticides, disease, nutritional deficiencies, and commercial beekeeping itself - so it’s unlikely there’ll be a simple resolution. The EU voted to ban the use of neonicotinoid pesticides in 2018 but in lieu of global policy change, innovative IoT solutions have already shown serious promise for helping bees survive.

The Internet of Stings

Being able to know when a colony is in trouble and act quickly is imperative to beekeeping. Traditionally, this has meant regular check-ins with the hive, a practice that comes with some disruption to bee life. But with IoT solutions that incorporate wireless in-hive sensors, beekeepers can better keep tabs on their colonies in real time and from a distance.

At the Polytech Sorbonne University in Paris, a student developed a precision beekeeping box that can take temperature, humidity and weight readings, as well as detect the presence of a queen bee. With the data displayed on their Ubidots dashboard, beekeepers can then take steps to decrease resource consumption and increase productivity.

In Costa Rica, college students developed the Ubidots-powered Internet De Las Abejas, a project aimed at controlling varroa mites. Varroas stick to bees, suck their hemolinph, and spread the diseases they carry - posing a major threat to honey bee health. In better controlling them, beekeepers can improve the quality of life of their hives, while also increasing honey production and pollen mobility.

Another approach, developed by researchers in Manchester, is the tagging of bees with RFID chips to track their movements. With location data, beekeepers can follow their comings and goings to better understand and predict their behavior. Grad students in Canada have also been studying the use of sensor data to listen in on beehives and detect communication patterns in the buzz.

But easily the biggest buzz in IoT-enabled solutions is the development of robot bees, or pollination drones. Straight out of a “Black Mirror” episode, RoboBees were introduced by Harvard University researchers in 2013. While their first iterations were limited to flying and hovering, they can now swim underwater and stick to various surfaces. Robotic bees of the future could potentially work farms like their natural counterparts, pollinating crops and helping offset population losses.

No matter what form our ‘IoBees’ solutions take, the collecting and sharing of data will give us profound insights into their lives. Researchers and IoT Entrepreneurs all over the world are realizing the potential of aggregating this data into IoT dashboards, creating IoT solutions that can be commercially offered to either the farmers or research institutions.

Such array of projects aimed at tackling the bee crisis shows the powerful potential for IoT to help save the bees that feed our world.

#### And IoT vulnerabilities risk extinction.

Turchin 20 (Alexey Turchin, Global risks expert, graduated from Moscow State University; Dr. David Denkenberger, Ph.D. from the University of Colorado at Boulder in the Building Systems Program, M.S.E. from Princeton in Mechanical and Aerospace Engineering, B.S. from Penn State in Engineering Science, “Classification of global catastrophic risks connected with artificial intelligence,” March 2020, <https://www.researchgate.net/publication/324935393_Classification_of_global_catastrophic_risks_connected_with_artificial_intelligence>, TM)

3. Global catastrophic risks from narrow AI and AI viruses 3.1. Overview Narrow AI may be extremely effective in one particular domain and have superhuman performance within it. If this area of strength can cause harm to human beings, narrow AI could be extremely dangerous. Methods for controlling superintelligent AI would probably not be applicable to the control of narrow AI, as narrow AIs are primarily dependent on humans. 3.2. Risk that viruses with narrow AI could affect hardware globally There are currently few computer control systems that have the ability to directly harm humans. However, increasing automation, combined with the Internet of Things (IoT) will probably create many such systems in the near future. Robots will be vulnerable to computer virus attacks. The idea of computer viruses more sophisticated than those that currently exist, but are not full AI, seems to be underexplored in the literature, while the local risks of civil drones are attracting attention (Velicovich 2017). It seems likely that future viruses will be more sophisticated than contemporary ones and will have some elements of AI. This could include the ability to model the outside world and adapt its behavior to the world. Narrow AI viruses will probably be able to use human language to some extent, and may use it for phishing attacks. Their abilities may be rather primitive compared with those of artificial general intelligence (AGI), but they could be sufficient to trick users via chatbots and to adapt a virus to multiple types of hardware. The threat posed by this type of narrow AI becomes greater if the creation of superintelligent AI is delayed and potentially dangerous hardware is widespread. A narrow AI virus could become a global catastrophic risk (GCR) if the types of hardware it affects are spread across the globe, or if the affected hardware can act globally. The risks depend on the number of hardware systems and their power. For example, if a virus affected nuclear weapon control systems, it would not have to affect many to constitute a GCR. A narrow AI virus may be intentionally created as a weapon capable of producing extreme damage to enemy infrastructure. However, later it could be used against the full globe, perhaps by accident. A “multi-pandemic,” in which many AI viruses appear almost simultaneously, is also a possibility, and one that has been discussed in an article about biological multi-pandemics (Turchin et al. 2017). Addressing the question about who may create such a virus is beyond the scope of this paper, but history shows that the supply of virus creators has always been strong. A very sophisticated virus may be created as an instrument of cyber war by a state actor, as was the case with Stuxnet (Kushner 2013). The further into the future such an attack occurs, the more devastating it could be, as more potentially dangerous hardware will be present. And if the attack is on a very large scale, affecting billions of sophisticated robots with a large degree of autonomy, it may result in human extinction. Some possible future scenarios of a virus attacking hardware are discussed below. Multiple scenarios could happen simultaneously if a virus was universal and adaptive, or if many viruses were released simultaneously. A narrow AI virus could have the ability to adapt itself to multiple platforms and trick many humans into installing it. Many people are tricked by phishing emails even now (Chiew et al. 2018). Narrow AI that could scan a person’s email would be able to compose an email that looks similar to a typical email conversation between two people, e.g. “this is the new version of my article about X.” Recent successes with text generation based on neural nets (Karpathy 2015; Shakirov 2016) show that generation of such emails is possible even if the program does not fully understand human language. One of the properties of narrow AI is that while it does not have general human intelligence, it can still have superhuman abilities in some domains. These domains could include searching for computer vulnerabilities or writing phishing emails. So while narrow AI is not able to self-improve, it could affect a very large amount of hardware. A short overview of the potential targets of such a narrow AI virus and other situations in which narrow AI produces global risks follows. Some items are omitted as they may suggest dangerous ideas to terrorists; the list is intentionally incomplete. 3.2.1. Military AI systems There are a number GCRs associated with military systems. Some potential scenarios: military robotics could become so cheap that drone swarms could cause enormous damage to the human population; a large autonomous army could attack humans because of a command error; billions of nanobots with narrow AI could be created in a terrorist attack and create a global catastrophe (Freitas 2000). In 2017, global attention was attracted to a viral video about “slaughterbots” (Oberhaus 2017), hypothetical small drones able to recognize humans and kill them with explosives. While such a scenario is unlikely to pose a GCR, a combination of cheap AI-powered drone manufacture and high-precision AI-powered targeting could convert clouds of drones into weapons of mass destruction. This could create a “drone swarms” arms race, similar to the nuclear race. Such a race might result in an accidental global war, in which two or more sides attack each other with clouds of small killer drones. It is more likely that drones of this type would contribute to global instability rather than cause a purely drone-based catastrophe. AI-controlled drones could be delivered large distances by a larger vehicle, or they could be solar powered; solar-powered airplanes already exist (Taylor 2017). Some advanced forms of air defense will limit this risk, but drones could also jump (e.g., solar charging interspersed with short flights), crawl, or even move underground like worms. There are fewer barriers to drone war escalation than to nuclear weapons. Drones could also be used anonymously, which might encourage their use under a false flag. Killer drones could also be used to suppress political dissent, perhaps creating global totalitarianism. Other risks of military AI have been previously discussed (Turchin and Denkenberger 2018a). 3.2.2. Stuxnet-style viruses hack global critical infrastructure A narrow AI virus may also affect civilian infrastructure; some, but not all ways in which this could be possible are listed below. Remember that in the case of global catastrophes, the conditions necessary for most catastrophes could exist simultaneously. Several distinctive scenarios of such a catastrophe have been suggested. For example, autopilot-controlled and hacked planes could crash into nuclear power stations. There are around 1000 nuclear facilities in the world, and thousands of large planes are in the air at every moment—most of them have computerized autopilots. Coordinated plane attacks happened in 2001 and a plane has been hacked (Futureworld 2013). Self-driving cars could hunt people, and it is projected that most new cars after 2030 will have some selfdriving capabilities (Anderson 2017). Elon Musk has spoken about the risks of AI living in the Internet; it could start wars by manipulating fake news (Wootson 2017). Computer viruses could also manipulate human behavior using blackmail, as seen in fiction in an episode of Black Mirror (Watkins 2016). Another example is creating suicide ideation, e.g., the recent internet suicide game in Russia, “Blue Whale” (Mullin 2017), which allegedly killed 130 teenagers by sending them tasks of increasing complexity and finally requesting their suicide. The IoT will make home infrastructure vulnerable (Granoff 2016). Home electrical systems could have short circuits and start fires; phones could also catch fire. Other scenarios are also possible: home robots, which may become popular in the next few decades, could start to attack people; infected factories could produce toxic chemicals after being hacked by viruses. Large-scale infrastructure failure may result in the collapse of technological civilization and famine (Hanson 2008; Cole et al. 2016). As industries become increasingly computerized, they will completely depend on proper functioning of computers, while in the past they could continue without them. These industries include power generation, transport, and food production. As the trend continues, turning off computers will leave humans without food, heating, and medication. Many industries become dangerous if their facilities are not intensively maintained, including nuclear plants, spent nuclear fuel storage systems, weapons systems, and water dams. If one compares human civilization with a multicellular organism, one could see that multicellular organisms could die completely, down to the last cell, as the result of a very small intervention. As interconnectedness and computerization of the human civilization grow, we become more and more vulnerable to information-based attacks. 3.2.3. Biohacking viruses Craig Venter recently presented a digital-biological converter (Boles et al. 2017), which could “print” a flu virus without human participation. The genomes of many dangerous biological viruses have been published (Enserink 2011), so such technology should be protected from unauthorized access. A biohacker could use narrow AI to calculate the most dangerous genomes, create many dangerous biological viruses, and start a multipandemic (Turchin et al. 2017). A computer virus could harm human brains via neurointerfaces (Hines 2016). 3.2.4. Ransomware virus paying humans for its improvement In 2017, two large epidemics of ransomware viruses affected the world: WannaCry and Petya (BBC 2017). The appearance of cryptocurrencies (e.g., bitcoin) created the potential for secret transactions and machine-created and machine-owned money (LoPucki 2017). As the IoT grows, the ransomware industry expected to thrive (Schneier 2017). Ransom viruses in the future may possess money and use it to pay people to install ransomware on other people's computers. These viruses could also pay people for adding new capabilities to the viruses. As a result, this could produce self-improving ransomware viruses. We could call such virus a “Bitcoin maximizer.” In a sense, the current bitcoin network is paying humans to build its infrastructure via “mining.” The catastrophic risk here is that such a system is paying humans to exclude humans from the system. In some sense, capitalism as an economic system could do the same, but it is limited by antimonopoly and other laws, as well as by welfare states. 3.2.5. Slaughterbots and the dangers of a robotic army Robotic minds do not require full AGI to have some form of agency: they have goals, subgoals, and a world model, including a model of their place in the world. For example, a robotic car should predict the future situation on a road, including the consequences of its own actions. It also has a main goal—travel from A to B—which constantly results in changes to the subgoal system in the form of route creation. A combination of this type of limited intelligence with limited agency may be used to turn such systems into dangerous self-targeting weapons (Turchin and Denkenberger 2018b). 3.2.6. Commentary on narrow AI viruses It appears that if a narrow AI virus were to affect only one of the above-listed domains, it would not result in an extinction-level catastrophe. However, it is possible that there will be many such viruses, or a multipandemic (Turchin et al. 2017), or one narrow AI that will be able to affect almost all existing computers and computerized systems. In this case, if the virus(es) were deliberately programmed to create maximum damage—which could be in a case of a military grade Narrow AI virus, like the advanced version of Stuxnet (Kushner 2013)—global catastrophe is a possible result. If the appearance of narrow AI viruses is gradual, antivirus companies may be able to prepare for them. Alternatively, humans could turn off the most vulnerable systems in order to avoid a global catastrophe. However, a sudden breakthrough or a synchronized surprise attack could spell doom. 3.3. Failure of nuclear deterrence AI Nuclear weapons are one of the most automated weapon systems. Because they must be launched immediately, almost all decision making has been done in advance. An early warning alert starts a preprogrammed chain of events, where the high-level decision should be made in minutes, which is far from optimal for human decision-making. However, the history of nuclear near misses shows (Blair 2011) that computer mistakes have been one of the main causes, and only quick human intervention has prevented nuclear war, e.g., the actions of Stanislav Petrov in 1983 (Future of Life Institute 2016). We can imagine failure modes of accidental nuclear war resulting from failure of the nuclear weapons control system. They may be similar to the Russian “dead hand” perimeter system (Bender 2014), arising if a strategic planning AI chooses a dangerous plan to “win” a nuclear war, like a Doomsday weapon (Kahn 1959), blackmail, or a pre-emptive strike.

#### Scenario 3 is ESC:

#### Effective state regulatory experimentation vital to effective embryonic stem cell research

Murray 6 [Tammy Murray, J.D. Candidate, 2006, Indiana University School of Law - Indianapolis; M.B.A., 2001, B.S., 1994, University of Missouri, 2006, https://mckinneylaw.iu.edu/ihlr/pdf/vol3p263.pdf

Political judgments about particular health care reform requirements are products of personal experience, political beliefs, and local economic and social conditions. These factors change substantially from one region of the United States to another. To be acceptable and tailored to individual citizen's needs, health care reform and experimentation must take account of the real differences between New York and California, Indiana and Arizona. It is specifically in this context that federalism can play a crucial role in making real medical reform and state experimentation feasible, successful, and acceptable to most citizens.

The argument for state experimentation was given its most famous expressions in opinions by Justices Holmes and Brandeis. Brandeis' articulate argument in New State Ice Co. v. L.iebmann8 has become part of the federalist phrase: "It is one of the happy incidents of the federal system that a single courageous State may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country."9 A decade earlier, Holmes set the stage for this argument by praising federalism for allowing states to be ''insulated chambers" in which legislative experimentation could be undertaken with little danger to other states or the nation. 10 In essence, the laboratory of democracy theory supports the idea that states should be able to test their own solutions to problems observed in their constituencies and diverge from national solutions that prove ineffective. 11

Perhaps the Court's recent decisions in favor of constitutionally supported state authority will be a return to Justice Brandeis' vision of fifty independent laboratories yielding their best results for the nation. 12 This proposition is true especially in areas of diverse solutions, where states may implement legislation that likely never will obtain national consensus. B. Cu"ent State Experimentation in Health Care Several states in the absence of national solutions have been innovators in health care litigation and financing reform as well as morally controversial areas that lack a national consensus. State'experimentation, both successes and failures, is the key to Justices Holmes and Brandeis' theory of state laboratories.

1. Medicinal Marijuana

The voters of California, through the state's initiative process, passed the Compassionate Use Act of 199613 to ensure that seriously ill Californians have the "right to obtain and use marijuana for medical purposes,"14 that "patients and their primary caregivers who obtain and use marijuana for medical pwposes . . . are not subject to criminal prosecution/'15 and ''to encourage the federal and state governments to implement a plan to provide for the safe and affordable distribution of marijuana to all patients in medical need ofmarijuana."16 California's law is in direct conflict with-federal laws, which classify marijuana as a Schedule I controlled substance, making the use and distribution illegal.17

Had voter mandates legalizing medicinal marijuana been enacted in only a few states, federal enforcement strategies such as suspending a health care provider's license and prohibiting participation in Medicare or Medicaid programs might well have suppressed state initiatives.18 Since the midnineties, however, eleven states and two localities19 have passed medical marijuana laws similar to California's and have in some way lessened or eliminated state criminal penalties for possessing medicinal marijuana. 20 The United States Court of Appeals for the Ninth Circuit has ruled that states are free to adopt medicinal marijuana laws so long as itis not sold, transported across state lines or used for nonmedicinal purposes.21 This ruling only applies to the western states in the Ninth Circuit's jurisdiction and has been appealed to the Supreme Court.22 On November 29,2004, the United States Supreme Court heard oral arguments in Ashcroft v. Raic~3 and reversed the Ninth Circuit and held that wholly intrastate, non-commercial cultivation, possession, and use of marijuana in accordance with state law does not place a person beyond the reach of the federal government under the Controlled Substance Act.

2. Physician-Assisted Suicide

Voters of Oregon legalized physician-assisted suicide ( .. PAS") in 1994.24 The Oregon Death with Dignity Act allows terminally ill Oregon residents to obtain prescriptions for self-administered, lethal medications from their physicians and pharmacists. 25 The Act permits PAS, but specifically prohibits euthanasia or the direct administration of a medication by a physician to end a person's life.26

On November 6, 2001, however, United States Attorney General John Ashcroft issued a directive which reinterpreted the Controlled Substances Act as to invalidate Oregon's Death with Dignity Act. 27 The directive stated that prescriptions issued for the purpose of assisting suicide were not a "legitimate medical purpose" and the use of a controlled substance to assist in suicide is per se illegitimate. 28 "This was the first time in history that the Controlled Substances Act was used to preempt state law."29 Ashcroft's directive threatens physicians with suspension of their medical licenses and possible criminal prosecution, even when they proceed in accordance with the Act.30 This invalidation of the Oregon Act through the federal prosecution of physicians is a clear interference with traditional state government powers: to regulate public health and medicallicensing.31

Moral decisions such as the legality ofPAS are profoundly personal and should be made as close to the voters as practical. 32 Voters have greater . influence and more opportunity to participate in policy decisions at the local or state level than at the national level and therefore, the state's electorate should detennine for themselves whether PAS is appropriate policy.33 Ashcroft's directive was held invalid at the district courf4 and appellate court levels based on federalism principles. 35 As a rationale supporting state sovereignty, the Supreme Court stated "[t]hroughout the Nation, Americans are engaged in an earnest and profound debate about the morality, legality, and practicality of physician-assisted suicide" and"[ o ]ur holding permits this debate to continue, as it should in a democratic society."36 This debate may not end with national consensus; however, state autonomy to experiment with and permit PAS should not be stifled by the federal government.

3. Embryonic Stem Cell Research

The national debate over the use of embryos for stem cell research has resulted in private entities conducting research without government guidelines or regulation. In 2004, Californians voted with a fifty-nine percent majority to borrow $3 billion to fund stem cell research over the next ten years. 37 California is targeting research areas such as new lines of embryonic stem cells ("ESC") where federal money is not available. 38 "Funding from the California Stem Cell Research and Cures Initiative, which may total as much as $350 million per year, could dwarf other expenditures on ESC."39 The National Institutes of Health spent less than $25 million on this type research in 2003, although it expended more than $380 million on adult stem cell research. 40 The pledge of new money might entice stem cell researchers to California and the strong public support of the research "certainly helps the field overall.'>41 Further, the competition may stimulate increased funding by other states. For example, New Jersey allocated $6.5 million for a new stem cell institute in May 2004.42

Embryonic stem cell research is a very controversial area in which a national consensus to spend federal tax dollars may never be achieved. California's initiative to experiment in this area is precisely defined by "a single courageous State may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country.'>43 Learning from the benefits and detriments of this experiment in California may lead to a national solution to the debate.

4. Partial-Birth Abortion

Another area of controversy is the legality and morality of a specific abortion procedure. President Bush signed the Partial-Birth Abortion Ban Act44 ("PBABA") into law in 2003; it is a federal ban on partial-birth abortions except when necessary to save the life of the mother.45 Specifically, § 153l(a) of PBABA provides: "[a]ny physician who, in or affecting interstate or foreign commerce, knowingly performs a partial-birth abortion and thereby kills a human fetus shall be fined under this title or imprisoned not more than 2 years, or both. •>46 Many states had implemented bans on partial-birth abortion prior to the enactment of the federal ban.47 A Nebraska statute, however, was found unconstitutional under a substantive Due Process challenge because the law lacked any exception "for the preservation of the ... health of the mother" and it "imposes an undue burden on a woman's ability" to choose the method of abortion, thereby burdening the right to choose abortion itself.48

Federal judges have predicted that the federal ban is likely to be unconstitutional because it contradicts the Supreme Court ruling that struck down the Nebraska statute.49 In the Court's words, although in a different context, ''the field of health care [is] a subject of traditional state regulation •••• " 50 The federal government may regulate economic activity within health care, but the noneconomic aspects of medicine may be off limits because of the tradition of state regulation in this domain and the lack of any real national interest.51 Subject only to the Fourteenth Amendment, the regulation of abortions has been the exclusive territory of the states before and after Roe v. Wade. 52 Congress uses its spending power to impose limits on the federal funding of abortions, but the actual regulation of abortions remains a state freedom. 53

Under Lopez and Morrison, the presumption of unconstitutionality established by the noneconomic nature of the activity is further strengthened by the traditional role of the states in regulating crime and health care, and by the weakness of the argument that partial-birth abortions substantially affect interstate commerce. 54 Even if the Court finds the federal ban on partial-birth abortion unconstitutional under the Commerce Clause, a national health care plan will allow Congress to control providers by exercising its spending power. 55

5. Health Care Financing and Medical Malpractice Reform

Laboratories of democracy are operating to meet states' economic concerns in providing for the health of their citizens. States have a large stake in health care reform; in 1999, twenty-seven percent of total state budgets were consumed by health care services. 56 In the 1980's when comprehensive health care reform dropped off the federal radar screen, states were left to develop solutions to their citizens' health care needs. S7 In addition, federal spending decreased and existing programs were used by the federal government to force participation in programs by insuring new groups. 58 These unfunded mandates and the federal government's increased state flexibility in offering Medicaid and Medicare waivers demanded greater state involvement in health care financing.

At the same time, the cost of care continues to increase and health care providers' reimbursement rates are decreasing; some providers are closing their practices to federal entitlement recipients such as Medicare patients. 59 While this outcome is contrary to the intended goal of the Medicare program, the impact does not stop there because "[m]ost of the nation's private health insurance companies benchmark their fee schedules to the Medicare physician fee schedule.'>60 Therefore, reimbursement rates decrease across the private market as well.

In the absence of federal solutions to the health care crisis and unfunded mandates to states by the federal government to retain participation in federal programs, states have become innovators in health care financing. Several states have undertaken comprehensive health care financing reform in diverse ways. While they have had varying degrees of success and can provide examples for other state reform, many of the states that abandoned universal coverage cite federal roadblocks to reform as the cause.61 Hawaii is perhaps the best known success story; it provides health care coverage for between ninety·five and ninety.eight percent of its adult population through an extraordinary combination of reform strategies.62 Other reform examples include Maryland's regulation ofhospital rates, which is the most developed and successful in the country, and New York's rate of growth in hospital spending, which is among the lowest.63

The states' familiarity with local health care delivery requires that they be the innovators of health care reform across the nation. ..States have implemented programs mandating employers to provide health insurance to their employees, rationing medical services to the poor, enlarging purchasing pools, expanding Medicaid to cover all uninsured residents at or below the federal poverty level, and providing improved benefits packages for children, among other reforms. "64 Successes in some states lay the foundation for further health care reform in other states. 6s

Also, states have been innovators in controlling medical costs associated with managed care, 66 malpractice litigation, 67 and defensive medicine. 68 Some states have enacted legislation of medical malpractice caps and set up medical review panels and boards.69 A 2003 study examined state data from 1993 to 2002 and found that a cap on noneconomic damages and a ban on punitive damages enacted together reduced malpractice premiums by more than onethird. 70 In addition, states without malpractice reform are facing decreased medical access and physician shortages.71 In 1975, Indiana was one of the first states to enact comprehensive malpractice reforms.72 Indiana's reforms have gained national attention and several states have used these reforms as a model. 73 California's medical malpractice reform also is successful and was the model for the federal Health Act of 2003, which passed the House and failed in the Senate by a margin of forty-nine to forty-eight.74 With further state testing, the likelihood of national comprehensive medical malpractice reform is encouraging.

State experimentation in the area of health care financing and medical malpractice reform allows states with similar problems to implement success;. ful programs. It also helps to prevent avoidable failures because states may learn from the mistakes of other states. Further, the diverse needs and desires of a state's electorate can be considered and met without putting the entire nation in jeopardy with a uniform solution that may not be the best or even an adequate solution for any one state.

#### Only ESC research addresses inevitable cell loss

Jaconi 3 [Marisa E. Jaconi, PhD, Biology of Aging Laboratory, Department of Geriatrics, Geneva University Hospitals 3-1-2003 <https://academic.oup.com/biomedgerontology/article/58/3/M279/684137>]

Abstract

The capacity of embryonic stem (ES) cells for virtually unlimited self renewal and differentiation has opened up the prospect of widespread applications in biomedical research and regenerative medicine. The use of these cells would overcome the problems of donor tissue shortage and implant rejection, if the cells are made immunocompatible with the recipient. Since the derivation in 1998 of human ES cell lines from preimplantation embryos, considerable research is centered on their biology, on how differentiation can be encouraged toward particular cell lineages, and also on the means to enrich and purify derivative cell types. In addition, ES cells may be used as an in vitro system not only to study cell differentiation but also to evaluate the effects of new drugs and the identification of genes as potential therapeutic targets. This review will summarize what is known about animal and human ES cells with particular emphasis on their application in four animal models of human diseases. Present studies of mouse ES cell transplantation reveal encouraging results but also technical barriers that have to be overcome before clinical trials can be considered.

CELL therapy is an increasingly attractive concept in modern transplantation medicine. For many clinical situations, replacement of lost cells would be the ideal treatment. These situations include age-related diseases with progressive cell loss (various types of congestive heart failure, brain degenerative diseases, and sarcopenia), traumatic tissue loss, and iatrogenic destruction of cells (e.g., bone marrow transplantation). In many cases, however, the development of cell therapeutic treatment approaches is hampered by an increasing lack of donors or by the lack of cells that are suitable for transplantation.

A possible solution to this problem lies in xenografts (i.e., transplantation of tissues of animal origin); however, for several reasons (ethical, immunological, infectious diseases), this approach has a limited usefulness. A way out of this problem would be the differentiation of embryonic stem (ES) cells into specific cell types and tissues. In fact, recent developments in the field of stem cell biology and, in particular, of human ES cells have generated hope that this lack of suitable cells can be overcome.

Isolated 4 years ago from preimplantation embryos by Thomson et al. (1), human embryonic stem (hES) cells have the capacity to differentiate into virtually all of the cell types building our body. These cells therefore hold the promise of forming any desired tissue in culture that could be used to treat a wide variety of conditions where age, disease, or trauma has led to tissue damage or dysfunction. This radical new approach of disease treatment would overcome the problems of donor tissue shortage and, by making the cells immunocompatible with the recipient, implant rejection.

#### Untreated cell loss causes extinction from telomere erosion

Stindl 14 – Reinhard Stindl. Professor at the Institute of Medical Biology. 2014. “The Telomeric Sync Model of Speciation: Species-Wide Telomere Erosion Triggers Cycles of Transposon-Mediated Genomic Rearrangements, Which Underlie the Saltatory Appearance of Nonadaptive Characters.” Die Naturwissenschaften, vol. 101, no. 3, pp. 163–186.

The last heresy — intrinsic causes of species extinction Of all the species that have existed at one time or another on earth, only about 1 in 1,000 is still alive; hence 99.9 % of species died out (Raup 1991, pp. 3–4). Clearly, according to Darwin’s theory, the causes of extinction must usually lie outside of the organism, because prospering species have been adapting for many thousands of years and must be very fit. As a consequence, all kinds of threats to species survival have been proposed — mostly humans, climate change, asteroids and limited food resources. Yet, in the Pleistocene, the average American did not have access to automatic fire weapons, craters of asteroid impacts have not been found and the climate (if ever) changed in a rather smooth way, which leaves us with the idea of limited food supply. Consequently, some authors have suggested that limited prey resources forced saber-toothed cats and American lions to utilize more of the remaining carcasses leading to a greater incidence of tooth breakage. The story goes that times were difficult and therefore both predominant carnivores became extinct 12,000 years ago. The Rancho La Brea tar seep deposits in California, representing the past 50,000 years, provide an abundance of remarkably well-preserved specimens. Based on the fossil record, rates of tooth breakage increased in both examined species until extinction. Especially in the American lions, shortly before extinction, a stunning 36 % were affected by this dental handicap. However, Desantis et al. (2012) clearly showed that the diet did not change, and extensive bone crushing cannot be the cause of dental degradation in these large carnivores. Schindewolf preferred an alternative explanation in his 1950 book and cited the Austrian paleontologist Othenio Abel, who described the very abundant evidence of Ice Age cave bears, which, shortly before becoming extinct, exhibited extremely wide variability and all kinds of manifestations of degeneration, including severe bone and tooth disease and injuries — even young animals were affected by these conditions (Schindewolf 1993 p. 322). Abel was convinced that degeneration of a species was a consequence of optimum existence (Abel 1980). Yet, Schindewolf notes: “The symptoms of the cave bears are strikingly similar to the disease-altered bones that Hansen described from Norman graves in Greenland” (Schindewolf 1993 p. 322). In contrast to the cave bears extinction, in Greenland living conditions seemed to be worsening during that time. Consequently, Schindewolf states: “We arrive at the same conclusion, that the actual causes of degeneration and extinction lie deeper and manifest themselves earlier than any environmental influences whatsoever” (Schindewolf 1993, p. 323). “Thus, the reasons for extinction or continued existence are essentially internal — they lie within the lineages themselves. As P. Jensen, C. Zimmer, Karl Beurlen and other authors believe, the reasons may perhaps be sought in an aging of the germ substance, a gradual loss of function in the sex glands resulting in reduced fertility” (Schindewolf 1993, p. 322). According to Otto H. Schindewolf, geological catastrophes would be only the last hit, putting an end to a process that had been underway for ages for internal reasons. “It is the same as when the wind finally topples an old and rotten tree” (Schindewolf 1993, p. 319). Cope’s Rule, the observed tendency for organisms in a lineage to increase in body size over time, is still poorly understood in terms of selection for fitness, especially in the many cases of gigantism. Alternatively, Schindewolf claimed that orthogenesis, the primary trend of evolution, is to blame. First, it yields a normal, beneficial size increase and later inevitably exceeds it and leads to a serious disadvantage and even to extinction of a species (Schindewolf 1993, p. 309). Since a larger body size requires more cell doublings, especially during lifelong regeneration of somatic tissues (Stindl 2004b), it is easy to imagine how increasing height in a lineage can have a negative effect on telomere reserve. Conflicting literature data on the mean telomere length of somatic tissues and its consequences for aging and age-associated diseases have been reported over the years. In my view, this has two main reasons: Almost all researchers investigate the telomere length of blood samples, despite the fact that mammalian red blood cells lack a cell nucleus and only telomeres of the small fraction of white blood cells can be measured. These immune cells show complex patterns of migration and replenishment, which are influenced by various factors (e.g., stress) and might, therefore, not provide a reliable picture of the telomere reserve of an individual. The other shortcoming is the widespread ignorance of the mechanisms of somatic tissue regeneration by adult stem cells (Stindl 2008). Consequently, I suggest that telomere length and the available number of adult tissue stem cells in a given species might be the determining factors of lifespan, regeneration capacity of tissues and aging. An anecdotal case of an endangered pack of wolves with unusual signs of aging and degeneration on Isle Royale in Michigan was recently reported in Science (Mlot 2013). The population was established six decades ago and remained stable until the 1980s when a viral disease reduced their numbers to a mere dozen. In 1997, a large male wolf from Ontario crossed the ice bridge. This wolf became whiter as he aged, something not seen before in Isle Royale wolves. He sired 34 offspring and genetically took over the population. Over the last years, physical abnormalities have increased to abnormal levels. In 2009, the majority of the wolves had some kind of spinal deformities. Another mystery is the occurrence of several wolves with one opaque eye, not seen before. Finally, in summer 2012, no pubs were born and the remaining population of four female and four male wolves now faces extinction. Some researchers at Isle Royale blame inbreeding for the signs of degeneration (Räikkönen et al. 2009), although an opaque eye is usually a result of aging, not inbreeding. Telomere length measurements might bring new aspects into the discussion. A high percentage of ancient Egyptians were considerably crippled, by changes in the vertebral column and by lesions of the peripheral articulations (Ruffer 1919; Moodie 1923). Similarly, 38 % of ancient Egyptians and 25 % of ancient Peruvians with a mean age at death of around 40 years showed signs of atherosclerosis (Thompson et al. 2013). Unfortunately, an accurate chronological survey of cases of degeneration and atherosclerosis is not possible based on the findings of these studies. Yet, it was shown that the health of pre-Columbian populations significantly deteriorated long before Columbus arrived and climatic distinctions were completely irrelevant. Surprisingly, hunter–gatherers, who lived several millennia ago, were the healthiest Native Americans in stark contrast to the later people, who lived in times of agriculture, government and urbanization. About 90 % of the aboriginals may have died within the following two centuries after the arrival of the Spanish; however, the authors found the long-term trend towards a poor health status of aboriginal populations to be the causal factor of the speed and ease of the conquest (Steckel and Rose 2002). Clearly, a thorough reexamination of all signs of degeneration in troubled species or populations is needed, to put the new theoretical model of an intrinsic extinction mechanism on solid scientific grounds. In accordance with the aging of the germ substance idea cited by Schindewolf, the telomeric sync model of speciation is based on transgenerational telomere erosion, which can lead to decreased fertility (Baird et al. 2006) and an increase of age-associated (Sharpless and DePinho 2007) and all sorts of degenerative diseases (Chang et al. 2004) at the end of a species lifespan. Age-associated diseases, like cancer, cardiovascular disease, immunosenescence and dementia, and degenerative diseases of teeth, bones and joints, are proposed to culminate even in middle-aged individuals and fertility decreases. Critically short telomeres in somatic tissues and in germ cells of individuals have been shown to be capable of causing all these kind of health issues. During such a transformation phase, the species either transforms into a new species, or stabilizes its telomeres, or becomes extinct. However, since the phenotypic change, triggered by short telomeres and mediated by transposons, can be enormous, the close relationship of two species might be invisible in the fossil record. Consequently, the extinction of some species might be an artifact of the fossil record caused by the gradualistic genetic model of evolutionary theory. It is my conviction that some extinctions, like the ones of the Neanderthals, will one day turn out to be transformations. Go to: Hominin evolution: extinction and complete replacement of archaic humans worldwide … really? Some years ago, the evolution of hominins was every neo-Darwinist’s darling. It was all about an African progressing series of archaic hominins resulting in the superbright Homo sapiens spreading out of Africa and replacing all other dumb relatives worldwide. Nowadays, according to Kimbel the story reads differently: “The evolutionary events that led to the origin of the Homo lineage are an enduring puzzle in palaeoanthropology.” (Kimbel 2013) What happened? Well, it turned out that instead of a gradual phenotypic change towards perfection, nature seems to have played around with different combinations of “archaic” and “modern” body parts that make no sense under the light of genetic gradualism. A series of reports published this year in Science focused on fossilized skeletons of Australopithecus (Kimbel 2013). One sample of Australopithecus afarensis has an upper thorax more similar to modern humans, although it is 1.6 million years older than Australopithecus sediba, which has an ape-like pectoral girdle (Kimbel 2013). Furthermore, the fossilized skeletons of A. sediba had a surprisingly ape-like calcaneus, in contrast to its Homo-like mandibles. To further complicate matters, although Australopithecus is usually characterized by six lumbar and four sacral vertebrae, in A. sediba the modern human pattern is seen, which is five lumbar and five sacral vertebrae (Kimbel 2013). If the phenotypic confusion in the hominin lineage still leaves some unconvinced, let us turn to comparative sequencing data. Based on the fact that mitochondrial DNA of all Neanderthal specimens falls outside the variation of present-day humans, interbreeding between archaic and modern humans was a no-go for many years (Ward and Stringer 1997). However, the draft sequence of the Neanderthal genome clearly confirmed archaic genes in our genome and the authors suggested a unidirectional gene flow from Neanderthals into the non-African ancestors of present-day humans before the Eurasian split (Green et al. 2010). In the same year, the sequencing of the DNA extracted from a finger bone led to the birth of a new archaic cousin in southern Siberia, the Denisovan (Reich et al. 2010). Again, it was found that the Denisovan man, similar to the Neanderthal, contributed 4–6 % of its genetic sequence to modern humans, although to Melanesians only (Reich et al. 2010). A 100-year-old lock of hair from an Aboriginal man in southern Western Australia revealed similar admixture rates with archaic humans (Rasmussen et al. 2011). And so, it was concluded that Homo sapiens interbred with now-extinct forms of humans all over the world (Gibbons 2011). According to a 2011 Science study, more than half the HLA alleles of modern Eurasians must have introgressed due to multiple and widespread admixtures with archaic humans. The authors suggested that the surprisingly high numbers were the consequence of some sort of selection (Abi-Rached et al. 2011). Yet, if one considers that the reproductive barriers of different chromosome complements effectively prevent the vertical spread of foreign genes in a population, it remains an eternal mystery how the proposed sexual activities of our immediate ancestors with all kinds of archaic hominins could result in significant numbers of fertile offspring. Of course, we do not know the karyotype of Neanderthals or Denisovans, but differing chromosome complements are the hallmarks of closely related species (White 1978; Cho et al. 2013) and extinct hominins were successful and independent species for many thousands of years. Besides the surprising sequencing data, the paleoanthropologists have always pointed to certain bone and dental features of Neanderthals that apparently survived in all modern Europeans (Trinkaus 2007). Already in 1943, Franz Weidenreich, one of the early proponents of the multiregional model, wrote: “Two years ago I published an article (…) dealing with the obvious incongruities of the morphological and chronological sequences of the various evolutionary stages of Man as they appear on the basis of steadily increasing discoveries of recent years. At the very appearance of true hominids there must have already existed several different branches, morphologically well distinguishable from one another, which all proceeded in the same general direction with mankind of today as their goal” (Weidenreich 1943). The telomeric sync model of speciation predicts successive series of defined chromosome rearrangements and genomic repatternings in all individuals of a species within similar time intervals, worldwide. Accordingly, the remains of archaic genes and phenotypic traits found in modern humans, typical for local archaic hominins, might be a consequence of directly developing from these local ancestors through a defined genomic repatterning. The telomeric clock that triggers programmed rearrangements and transposon-mediated repatternings in combination with worldwide gene flow within a species might be responsible for the proposed 99.9 % sequence identity in human populations around the world, despite the separate development of local lineages for many thousands of years. Clearly, the unexpected finding of a unidirectional gene flow from Neanderthals into modern humans only, but not in the other direction (Green et al. 2010; Wills 2011), inevitably supports the multiregional concept of local archaic humans directly transforming into modern humans. In other words, there were no other local and healthy archaic humans left to interbreed with, once the new generation of modern humans evolved from them. It is an indisputable fact that the observed one-way genetic exchange from archaic to modern humans shakes the foundations of the currently favored admixture and interbreeding model, which is thought to result in some sort of bidirectional gene flow. For all these years, modern humans have been regarded as being superior to their archaic counterparts, and now, even if the standard population genetic model predicts a bidirectional gene flow with a dominating modern-to-archaic direction, the neo-Darwinists suddenly discover the exclusive superiority of archaic genes from a dying human lineage. The Danish embryologist Søren Løvtrup once commented: “And today the modern synthesis (…) is not a theory, but a range of opinions which, each in its own way, tries to overcome the difficulties presented by the world of facts” (Lovtrup 1987, p. 144). Go to: The transformation or bifurcation phase as exemplified in Finnish blue foxes and humans In a Finnish farm, several hundred blue foxes, parents and offspring, were analyzed over 4 years. About half of them had a Robertsonian translocation in a heterozygous form (2n = 49), whereas a quarter were homozygous carriers (2n = 48) and a quarter had the original karyotype with two acrocentrics (2n = 50). As expected and predicted by genetics, litter size tended to be smaller in mating groups of chromosomal heterozygotes in this study (Makinen and Lohi 1987), in contrast to a previous report (Moller et al. 1985) but in line with an older study (Christensen and Petersen 1982). Surprisingly and contrary to the predictions, animals with the Robertsonian translocation in a homozygous form (2n = 48) increased over the 4-year span (Makinen and Lohi 1987). Accordingly, it was observed that matings of two heterozygotes seemed to favor the 2n = 48 offspring production (Makinen and Lohi 1987) and the spread of a new chromosomal race. It was therefore shown that the blue fox displayed an evolutionary tendency towards a lower chromosome number and that the Robertsonian translocation in its homozygous form had a positive effect on fertility. If, after 30 years, this farm still exists and breeders have not intervened based on karyotypes, a re-examination of the descendants of these animals would be an interesting project. In humans too, Robertsonian translocation (ROB) is the most common recurring chromosomal rearrangement. De novo formation of fusions between chromosome 13 and 14, rob(13q14q), accounts for the largest proportion of ROBs (Page and Shaffer 1997). Jacobs states: “The reason for the high mutation rate of human Robertsonian translocations in general, and for the 13/14 translocation in particular, is obscure” (Jacobs 1981). Several scenarios have been put forward to explain this phenomenon. Bandyopadhyay and colleagues proposed illegitimate recombination between paralogous satellite III DNA on acrocentric chromosomes. They classified ROBs into two groups: Class I, mainly rob(13q14q) and rarely rob(14q21q), account for 85 % of ROBs, and class II includes all other sporadic ROBs. Breakpoints of the common class I ROBs are almost always in the same region, whereas sporadic class II ROBs are characterized by varying breakpoints. Regarding these class II ROBs, the authors write: “The variable breakpoint could result from breakage and exchange in repetitive DNA, such as satellite III DNA sequences, that are common to all acrocentric short arms and the pericentromeric regions of these chromosomes” (Bandyopadhyay et al. 2002). Since a sporadic breakpoint within repetitive DNA would always vary, and this is not seen in the majority of common ROBs (Bandyopadhyay et al. 2002), I conclude that illegitimate recombination between paralogous satellite III DNA cannot be the source of common human ROBs. Another mechanism, which has been put forward, is based on the fact that acrocentric chromosomes come physically near to form the nucleolus, because of rDNA genes. However, human rDNA genes are located on the short arms of all acrocentric chromosomes (13, 14, 15, 21, and 22; Henderson et al. 1972) and cannot explain why just two combinations, which are rob(13q14q) and rob(14q21q), are constituting 85 % of all ROBs, why the breakpoints are almost always in the same region and why 95 % of de novo cases originate during maternal meiosis (Page and Shaffer 1997; Bandyopadhyay et al. 2002). Rescue comes from the observation of nonrandom telomere patterns in humans (Graakjaer et al. 2006) and the indirect evidence of telomere erosion in the female germline (see above). In a small study on 20 aged individuals, the telomere on the proximal end of chromosome 13 has been found to be the shortest and on the p-arms of chromosome 14, 15 and 21 one of the shortest (Graakjaer et al. 2006). Except for the short telomere on 15p, the telomere data fit the observed pattern of fusion products. Evidence for a prezygotic selection for ROBs in male humans has been described, similar to the meiotic drive of ROBs in the common shrew we discussed earlier (Hamerton 1968). Again, I propose the negative effect of short telomeres on fitness to be the underlying cause. Sperm cells containing a rearranged metacentric chromosome instead of two acrocentrics with eroded and unstable telomeres may simply be preferred. Based on the suggested telomere erosion in the human species and the nonrandom telomere profile, we would expect to see the appearance of a new chromosomal race, with 44 chromosomes and two rob(13q14q). Is there any evidence for such a transformation or bifurcation phase? During a cytogenetic study of an aged population, a heterozygous carrier of a rob(13q14q) was found. He was 90 years old and in good general health. The authors mentioned that he looked younger than his chronological age and that all his close relatives survived beyond the age of 80 (Anday et al. 1974). In 1984, Martinez-Castro and colleagues were the first to report on a Spanish family with heterozygous and homozygous carriers for a rob(13q14q) without any impairments of phenotype. They also observed an excess of homozygous carriers among the progeny of heterozygotes, in accordance with prezygotic selection for ROBs (Martinez-Castro et al. 1984). The stunning discovery was confirmed by a Finnish study based on three families with a female again being homozygous for rob(13q14q) and a karyotype of 44 chromosomes. The authors described the good health and normal phenotype of these individuals and speculated that rob(13q14q) might be the next step in the chromosomal evolution of man (Eklund et al. 1988). Clearly, a re-examination of these families is highly recommended. Furthermore, I suggest to undertake a cytogenetic survey of the 100 or so isolated aboriginal human populations worldwide, to measure telomere length and to search for alternative chromosomal races. Go to: Conclusions In this paper, I present an alternative to Darwin’s gradualistic theory and provide a biological framework for the old European concept of saltatory evolution, summarized best in Otto H. Schindewolf’s book, Basic Questions in Paleontology (Schindewolf 1993). The high quality of the fossil record in sediments of ancient oceans guarantee that Schindewolf’s extensive studies of corals and cephalopods are superior to the currently dominant genetic models of modern laboratory-based scientists. As a consequence, my telomeric sync model of speciation mainly builds on Schindewolf’s typostrophic theory. In short, I propose that transgenerational telomere erosion leads to identical chromosome fusions and triggers a transposon-mediated genomic repatterning in many individuals at once. The phenotypic outcome of the telomere-triggered and transposon-mediated repatterning is the saltatory appearance of nonadaptive characters in new species, which is in perfect agreement with the fossil record (Table 1). The species clock based on transgenerational telomere erosion gives species a sense of time and is therefore the material basis of aging at the species level. According to the telomeric sync model of speciation, speciation events can be triggered suddenly and simultaneously, eventually synchronizing the transformation of a whole interconnected biotope of many plant and animal species within a relatively short time frame. In addition to the studies and experiments I have already put forward to test the proposed model, the currently observed immunodeficiency of honeybees displays several signs of a telomere-driven species crisis (Stindl and Stindl 2010). A study of telomere length and chromosomal races in affected honeybee populations is therefore highly recommended. Similarly, the white-nose syndrome of North American bats should be reinvestigated in the light of telomere-driven immunosenescence (Buchen 2010). However, I have to point out that measuring mean telomere length is not sufficient because a single critically short telomere determines the viability of a cell (Hemann et al. 2001), possibly the life expectancy of an individual and according to the new evolutionary model, the duration of a species.

#### ESC research replaces organ tissue loss – avoids xenotransplantation

Lott 7 [Jason P. Lott, MD candidate University of Pennsylvania Julian Savulescu, Uehiro Professor of Practical Ethics at the University of Oxford, Fellow of St Cross College, Oxford, Director of the Oxford Uehiro Centre for Practical Ethics, Sir Louis Matheson Distinguished Visiting Professor at Monash University, 2007 http://www.tandfonline.com/doi/pdf/10.1080/15265160701462426]

ORGAN SHORTAGE PROBLEM

The shortage of donor organs and tissues for transplantation costs hundreds of thousands of unnecessary deaths each year. Approximately one million patients are on dialysis worldwide (Dirks 2005), and in India alone more than 7.5 million people experience chronic renal failure (Dash and Agarwal 2006). Almost “3 million Americans suffer from congestive heart failure ... deaths related to this condition are estimated at 250,000 each year ... 27,000 patients die annually from liver disease ... In Western Europe as a whole 40,000 patients await a kidney” (Cooper and Lanza 2000), but only approximately 10,000 kidneys or so become available each year.

It is unknown how many people fail to make it onto transplant waiting lists or fail to register in official morbidity and mortality statistics and reports. In addition to donor shortages, underdeveloped transplantation infrastructures also contribute to the organ shortage problem. Intensive care beds, skilled transplant teams, quality control mechanisms, and extensive coordination efforts each demand significant financial, professional, and personal investments, which are frequently lacking in many countries, especially in the developing world. However, without increases in the supply of transplantable organs, incentives or attempts to improve existing infrastructures are unlikely to surface (Erin and Harris 2003; Harris 2003a).

HUMAN EMBRYONIC STEM CELLS

hESCs could help relieve the current dependency on donated organs and reduce the number of transplant-related deaths. Undifferentiated pluripotent hESCs could be used to repair diseased and damaged tissue in vivo or grow transplantable tissue grafts and organs in vitro. Combination of both techniques could significantly narrow the supply-demand gap without causing the negative externalities usually associated with xenotransplantation, organ markets, paid organ donation programs, and other strategies that have been previously proposed for improving organ procurement.

Human stem cells can be classified into adult or embryonic types. Adult stem cells are more specialized than their completely undifferentiated embryonic counterparts, although both can give rise to a variety of differentiated cell lines. Current research, however, suggests that the pluripotency of transplanted adult stem cells significantly diminishes across generations; additionally, these cells may be exceedingly difficult to propagate in culture (Jiang et al. 2002). By contrast, hESCs derived from the inner mass of early blastocysts are not subject to these obstacles and may thus hold the most promise for advancing de novo organ growth and tissue renewal.

#### Xenotransplantation risks extinction – species loss and xenoosis

Bisong 15 – Peter B. Bisong, PhD Candidate in Philosophy at the University of Calabar, MBA, “Interference with Nature: Xenotransplantation Procedure and its Potential Effects on Man”, Online Journal of Health Ethics, 11(2), <http://aquila.usm.edu/cgi/viewcontent.cgi?article=1143&context=ojhe> [language modified]

Introduction

Xenotransplantation has the potential to not only harm animals; it would also affect the recipient as well as the non recipient and even the entire environment. The use of animals as xenografts would make most animals to go into extinction and thereby reducing the already over depleted biodiversity in the world. This is an injustice to animals that are arguably in possession of a right to existence in the ecosystem. To use them as means to satisfy the end of humans is unfair. It becomes more unjust if we understand that the end these animal xenografts, are meant to serve is outweighed by the problem that it would cause on the recipients and their relatives and to the entire world by extension. Xenografting is believed to be capable of introducing a novel disease into the world, a disease of the same kind as AIDS, which would be infectious and thus would endanger even the non-recipient of the xenografts. Xenografting is just like a time bomb waiting to explode. If it does lead to a world plague, who knows, perhaps, the whole world would be wiped out; for this disease could be more devastating than AIDS and other known killer diseases.

This research therefore, using the philosophical method of critical analysis and creativity carried out an intensive appraisal of the inherent dangers and ethical problems that surround xenografting and from there made some recommendations. It recommended that the billions of money put in the research for xenografting should be invested in the finding of the preventive measures of the ailments that xenotransplantation is out to cure. Researches should be geared at finding possible ways to remove these diseases from the human race entirely. Most of these ailments are traceable to environmental degradation, thus the billions of dollars used in the research on xenografting should be put in the maintenance of sustainable environment. When this is done the researcher believes that the problem that xenotransplantation was meant to solve would be alleviated in a way that is ethically laudable.

Meaning and Types of Xenotransplantation

Xenografting also called xenotransplantation is the transfer of organs, tissues and cells from species of a different kind to another. In this work we see it as the transfer of organs and tissues from animals to human. The use of animals as source of organs, tissues and cells for transplantation into humans has been practiced for some time now. This procedure (xenotransplantation or xenografting) started as far back as 1904-1906 with Mitt Carrel and Guthrie. They performed autogenous vein grafts, leg replantation in dogs, and the famous patch-grafts (Samdani http://emedicine.medscape.com/article/432418-o...).

xenotransplantation procedure is basically categorized into four; solid organ xenotransplantation, cell and tissue xenotransplantation and extracorporeal perfusion. Solid organ xenotransplantation is a procedure whereby an animal organ like kidney or liver is transplanted into human as a replacement of the original organ. Cell and tissue xenotransplantation is the transplantation of tissues and cells from source animals to human beings as replacement of the original tissues in humans. Extracorporeal perfusion is a procedure whereby the blood of the patient is made to circulate outside of the human body through animal organs, such as a liver or a kidney, or through a bio-artificial organ produced by culturing animal cells on an artificial matrix. Human/Animal Hybrid is a procedure where human cells are grown in a culture with non-human animal cells that are transplanted back into human patients.

Source Animals for Xenotransplantation

Chimpanzees were generally considered to be the best source animals for organ transplants compared to other primates because of their close affinity with humans, but due to their endangered status, attention were shifted to baboons. Baboons being the next most preferred source animals though existing in abundance, fared badly in captivity, have a long gestation period and are capable of few offspring. According to FDA (Food and Drug Administration) committee known as BRMAC (Biologic Response Modifiers Advisory Committee), nonhuman primate donors pose the greatest threat of transmitting latent, intracellular, or unidentified organisms, including retroviruses. The committee therefore, recommended that nonhuman primates should not be used as sources of xenotransplantation (US Food and Drug Administration. http://www.fda.gov/cber/rules/frigene011801.htm). This recommendation led the search for other suitable animal donors of organs. Most of the scientists are of the agreement that pigs have the potential to be the right candidate for organ donation. This is because pigs are in abundance, quick to mature, breed well in captivity have large litters, and have vital organs that are roughly the same in size to that of humans. Their use is also argued to be less resentful to the society because they are already an accepted source for societal meat. Pigs are also believed to be less likely to introduce new diseases to human because of their distance to humans in the evolutionary chain. Other reasons why pigs are preferred include:

1. Pigs because of their ability to fare well in captivity, can be raised in a highly controlled way, thus, their organs are less likely to transmit infectious diseases to humans.

2. Pigs could be genetically engineered to contain human genes. This would make the animal organs or cells to be readily accepted by the patient immune system. In spite of these advantages, pigs xenografts is believed to be capable of experiencing severe immunologic barriers than the nonhuman primates because of their distance from man in the evolutionary chain.

Potential benefits of Xenotransplantation

Xenotransplantation is believed to be capable of serving as a complete substitute for human organs, thus easing the current shortage available for transplantation. It could also serve as a bridge or temporary organ until a permanent human organ could be found. Other benefits of xenotransplantation include:

1. Xenografting is helpful in the treatment of diseases. People with serious kidney, liver or heart disease, diabetes or Parkinson’s disease which have defied all known treatment could be treated through xenotransplantation. People needing bone marrow transplants could also benefit from xenotransplantation. cellular xenotransplants for instance could treat people suffering from diabetes, Parkinson’s disease or other diseases. The treatment involves replacing specific cells or tissues which do not work properly as a result of the disease, for diabetes these cells are the islet cells of the pancreas; for Parkinson’s disease they would be brain cells. These cells are difficult to be obtained from human donors. People with liver failure could be treated with an extra-corporeal (outside the body) xenotransplant using a healthy pig liver. In this process, the patient’s blood circulation is made to pass through a pig liver that is kept outside the patient’s body. Sometimes this is meant to be temporary until a suitable human donor is sought for, but sometimes this is all that is needed to allow the person’s own liver to recover and start working again.

2. Xenografts give the surgeon enough time to eliminate potential pathogens. In allografting (human to human transplantation) organ which are usually transplanted from a brain dead patient are given little or no time for examination to ascertain the health state of the organ, due to the urgency involved. The transplant organ therefore could come from a suboptimal donor with advanced age and chronic medical condition or from a carrier with undetected infectious agents or malignant cells. In contrast, in xenotransplantation, a donor pig is raised under controlled conditions and specifically intended for use as an organ donor. In this case, the donor pig can be extensively analyzed to eliminate all pathogens.

3. In xenotransplantation animal donors could be genetically modified to be resistant to many human pathogens specific to human tissues, such as HIV, hepatitis, and human cytomegalovirus.

4. Introduction of xenotransplantation would eliminate ‘black market’ in human donor organs. Due to the scarcity of human donor organs and the large number of patients on the waiting list for organ transplantation, it is believed that human organs could be procured illegally. Some patients whose lives would have naturally been saved would be allowed to die by the doctors in order that their organs would be used for transplantation. Xenotransplantation it could be argued would help stem this abuse.

5. Xenografting could save hundreds of thousands of livers. This is because, patients who otherwise would not have been eligible for transplantation because of shortage of human organ, would receive organs and tissues through xenotransplantation. Xenotransplantation therefore could eliminate poor quality of life situation for patients, such as kidney dialysis.

Potential Risks of Xenografting

In spite of the numerous advantages that could accrue to humans if xenografting becomes a clinical success, there are a lot of risks that are associated with xenotransplantation. these risks include:

1. The risks of introduction of xenoosis: xenoosis is the infection of human by agents like bacteria, viruses, fungi. The possibility of transmission of infectious agents raise questions regarding the safety of using xenotransplantation in individuals, but it could also potentially place the general public at risk. Like humans, animals may also be infected with microorganism which could be specie specific (that is, it is not transmittable to other species). For instance, the transmissible virus of pigs causes diarrhoea in pigs but does not cause any sickness in people. However, other kind of micro-organisms is not specie specific, which means some of them can infect animals and also cause disease in humans. An example of this is influenza. The flu first infected birds and pigs and though, it does not make these animal sick, when it passed to humans, it makes them sick. The word xenozoonosis therefore, refers to zoonotic diseases that may pass to human through xenotransplant (Vanderpool, 1999). Most mammals are known to have a kind of virus embedded in their DNA known as “endogenous retroviruses.” These viruses are passed from one generation to the next without causing havoc in the host species. All pigs are believed to carry such viruses called PERVs (Pig or Porcine Endogenous Retroviruses). These are normally inactive and thus do not cause disease to the pigs. The concern among scientists is that PERV may become active and infect the human cells.

2. The xenograft may not work well especially if it is replacing an essential organ of human. Since the environment in which animal organs function are quite different from the one the human organ function in, it is feared that these organs may not function well in humans. For instance, the temperature which pig organs function in is 39 degree Celsius which is different from the 37 degree Celsius of humans. Also the life span of a pig is roughly 15 years, which brings the fear as to whether or not pigs transplants in man would live more than 15 years.

3. The high level of immunosuppressive drugs needed to overcome immune rejection may be counterproductive. This may leave the patient susceptible to other infections. The immune system fights foreign agents that invade the body like bacteria, fungi and viruses. Thus, suppression of the immune system would leave room for easy invasion of the body by these micro-organisms.

4. Xenotransplantation could potentially lead to a world plague. There are fears that xenotransplantation is capable of introducing novel infection to humans, which would be transmitted from [hu]man to [hu]man and thereby leading to a new world plague similar to HIV.

5. Xenotransplantation could lead to a lot of ethical dilemmas as shall be discussed in the next sub-heading.

#### The Court has recently narrowed Parker immunity to limit deference to the states in antitrust law

Allensworth 16 [Rebecca Haw Allensworth, Associate Professor of Law, Vanderbilt Law School; J.D., Harvard Law School; M.Phil, University of Cambridge; B.A., Yale University, October 2016, ARTICLE: THE NEW ANTITRUST FEDERALISM, 102 Va. L. Rev. 1387]

Introduction

IN just three relatively obscure antitrust cases, 1

[Footnote 1] N.C. State Bd. of Dental Exam'rs v. FTC, 135 S. Ct. 1101 (2015) [hereinafter NC Dental]; FTC v. Phoebe Putney Health Sys., Inc., 133 S. Ct. 1003 (2013); FTC v. Ticor Title Ins. Co., 504 U.S. 621 (1992).

the U.S. Supreme Court has quietly revolutionized how states and the federal government share power. These cases addressed a doctrine - unfamiliar to those outside of the field of antitrust law - that grants "state action" immunity from federal antitrust liability 2 and thus marks the thin line that insulates state regulation from wholesale invalidation through federal antitrust lawsuits. 3 For decades, the Court conceived of this line, and the "antitrust federalism" it effected, as a formal question about where the state ended and antitrust liability began. This was the old antitrust federalism: a boundary-drawing exercise that gave strong deference to state regulation. The Court's state action revolution ushers in a new antitrust federalism, one that all but dispenses with the notion of separate spheres in favor of something less deferential to the states - procedural review of state regulation.

Antitrust federalism may be less familiar than its constitutional cousin, but it is just as important - if not more so - to the state-federal balance of power. The Sherman Act forbids anticompetitive restraints of trade and monopolization of markets, and it does not seem to limit these prohibitions to private citizens and corporations. 4 Because regulation often tinkers with the free market economy and tends to create competitive winners and losers, Sherman Act liability for state conduct would severely restrict a state's ability to regulate within its borders. 5 So when [\*1390] the Court extended the reach of the Sherman Act - along with all federal regulation passed under the Commerce Clause - during the New Deal, 6 it became necessary to define an exemption for "state action" or risk the demise of state regulatory autonomy altogether. And state action immunity from the Sherman Act was born. 7

#### But, the current interpretation fails to account for interstate spillovers. Limiting Parker is crucial to establish federal role limiting regulatory externalities

Sack 21 [John Sack, J.D., Duke Law School, Class of 2022, B.S. University of Michigan, 2019, 2021 https://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=1196&context=djclpp\_sidebar]

III. DOCTRINAL CRITICISM

Although the Court has continued to re-affirm Parker v. Brown’s central holding, many have criticized the Parker doctrine. Both scholars and the Federal Trade Commission (FTC) have highlighted problems with the doctrine and offered a number of solutions for how to remedy its faults.63

The first common critique of the doctrine is that it does not account for out-of-state economic effects. Unless a regulation runs afoul of another constitutional barrier, no consideration of interstate spillovers applies.64 One need not look farther than Parker itself to see how the state action doctrine can impose costs on out-of-state residents, even though those residents have diminished political capital in the state. At the time Parker was decided, between 90 and 95 percent of raisins produced in California entered interstate commerce and California provided almost all of the nation’s raisins.65 Most American raisin consumers lived outside of California and had no political means to oppose the state’s legislative program, yet they bore the costs of California’s state-sanctioned monopoly.66

Second, similar concerns about political representation animate critiques of Parker immunity. The policy at issue in Parker restricted output and artificially raised prices, two results federal antitrust law generally seeks to prohibit.67 Although the benefits of such a program were borne almost exclusively by California, the costs of the program were incurred by raisin consumers across the nation.68 The political incentives to promote such a program follow closely with economic costs and benefits.69 California raisin producers have a strong incentive to lobby their own government to install such a program, but it would be nearly impossible for non-California residents to challenge such a policy through the normal political channels.70 The government of California is not the appropriate body to properly weigh the benefits to in-state raisin producers with the costs to out-of-state consumers, yet the Parker doctrine grants California per se immunity on federalism grounds.71 Although the California program was implicitly endorsed by Congress, one is just as likely to find similar programs with no similar implicit endorsement.72

The U.S. Constitution embodies a system of federalism where the federal government is sovereign in some respects, and the several states are sovereign in others.73 This system of federalism gives states the power to regulate local matters and the federal government the power to regulate issues that states are less suited to regulate.74 When costs spill over into other states, the national government becomes the appropriate body to regulate the costs and benefits of such a program.75 The Court has recognized such spillover effects, and how political actors, even government entities, can act solely in self-interest.76 Such state self-interest can directly harm consumers outside of its territorial jurisdiction.77

Parker immunity, as it stands, runs counter to longstanding ideals of national unity that harken back to the Founding era. The law has long prohibited states from imposing excessive costs on the nation as a whole, solely for the purpose of furthering its own intrastate policy interests. McCulloch v. Maryland illustrates the Court’s wariness of self-serving state action.78 In McCulloch, Chief Justice Marshall held that states may not tax the national bank, as they would be wielding power against the whole of the United States, even though the whole of the United States is not represented by each state.79 Similar to a state tax being problematic since it is the part acting on the whole, anticompetitive restraints by the states would unduly impose costs on the nation. The people of the United States, acting through Congress, christened competition and free markets through the Sherman Act.80 Just as one state could not tax the resources of the United States, one state should not be allowed to use state policy to burden the national economy. Because the potential costs to state-created monopolies are so high,81 federal policy should prohibit states from allocating those costs beyond their borders. Any state that wishes to impose monopoly costs outside of its borders to benefit itself and undermine competition should be carefully scrutinized when it does so. This scrutiny would not be fatal-in-fact for the legislation, but it should be enough for states to second-guess an attempt to enrich itself to the detriment of its sister states.

IV. PROPOSED SOLUTIONS

The Sherman Act, and specifically Parker immunity, should be interpreted in light of the above concerns. After all, the Sherman Act is the standard-bearer for the U.S. free market system, and so our interpretation of it should evolve with our understanding of constitutional principles and economic conditions.82 Justice Burger’s concurrence in City of Lafayette elaborates on this point:

Our conceptions of the limits imposed by federalism are bound to evolve, just as our understanding of Congress’ power under the Commerce Clause has evolved. Consequently, since we find it appropriate to allow the ambit of the Sherman Act to expand with evolving perceptions of congressional power under the Commerce Clause, a similar process should occur with respect to “state action” analysis under Parker. That is, we should not treat the result in the Parker case as cast in bronze; rather, the scope of the Sherman Act’s power should parallel the developing concepts of American federalism.83

As states impose costs on each other through state-sanctioned monopolies, the Court’s understanding of federalism and the Commerce Clause counsels scrutiny of the Parker doctrine. An entirely new doctrine is not necessary to curtail Parker immunity. Rather, the issue can be resolved by applying Parker immunity in light of the American dual system of federalism and the Commerce Clause. Modern scholarship critiques the lack of concern for interstate spillovers. By that token, the modern Parker doctrine fails to account for economic efficiency and undermines political representation values meant to be protected by federalism.84 So while scholars almost universally recognize that interstate economic spillovers are problematic, there is no consensus on what remedy is most appropriate.

#### Failure to hold states accountable for spillovers destroys optimal state experimentation – correctly “right sizing” regulation impossible without accounting for externalities in interjurisdictional competition

Adler 20 [Jonathan H. Adler, Case Western University School of Law, 2020 <https://scholarlycommons.law.case.edu/cgi/viewcontent.cgi?article=3058&context=faculty_publications>]

The race-to-the-bottom theory presumes that interjurisdictional competition creates a prisoner’s dilemma for states. Each state wants to attract industry for the economic benefits that it provides. Each state also wishes to maintain an optimal level of environmental protection. However, in order to attract industry, the theory holds, states will lower environmental safeguards so as to reduce the regulatory burden they impose upon firms. This competition exerts downward pressure on environmental safeguards as firms seek to locate in states where regulatory burdens are the lowest, and states seek to attract industry by lessening the economic burden of environmental safeguards. Because the potential benefits of lax regulation are concentrated among relatively few firms, these firms can effectively oppose the general public’s preference for environmental protection regulation. This will lead to social welfare losses even if environmental harm does not spill over from one state to another. The result, according to the theory, is the systematic under-regulation of environmental harms, and a need for federal intervention.26

The race-to-the-bottom theory may have had some basis in the 1960s and 1970s, but there is little reason to believe that this dynamic inhibits state regulatory efforts today, particularly given how aggressive many states are in environmental policy. Empirical evidence that states race to relax their environmental regulations in pursuit of outside investment is decidedly lacking. If the prospect of interstate competition discourages state-level environmental regulation, it is hard to explain why state environmental regulation often preceded federal intervention and why many states adopt more stringent measures than federal regulations require. Numerous studies have been conducted attempting to determine whether a race-to-the-bottom can be observed in the context of environmental regulation, and they have generally failed to find any evidence that environmental quality worsens when states are given more flexibility to set their own priorities.27 Indeed, some studies have \found precisely the opposite: that when states have more flexibility to set their own environmental priorities they increase their efforts.28

None of the above should be taken as an argument against all federal environmental regulation. For just as the federal government is overly interventionist in localized environmental concerns, the federal government is unduly absent in areas where a federal presence is most necessary. That is, the undue centralization of some environmental concerns co-exists with substantial federal abdication from concerns the federal government should be addressing. The federal government devotes relatively little of its regulatory resources on those matters for which the federal government possesses a comparative advantage and abdicates its responsibility to provide the data and knowledge base necessary for successful environmental regulation at all levels of government.

It is often remarked that environmental problems do not respect state borders. This is unquestionably true, and the observation provides ample justification for federal measures to address transboundary pollution problems.29 Where pollution or other environmental problems span jurisdictional borders there is less reason to believe state and local jurisdictions will respond adequately.

Consider a simple transboundary pollution problem involving two states, A and B. When economic activity in State A causes pollution in State B, State A is unlikely to adopt measures to prevent the resulting environmental harm because it would bear the primary costs of any such regulatory measures, without capturing the primary benefits. Put simply, State A is unlikely to impose costs on itself to benefit State B. Absent some external controls or dispute resolution system, the presence of interstate spillovers can actually encourage polices that externalize environmental harms, such as subsidizing development near jurisdictional borders so as to ensure that environmental harms fall disproportionately “downstream.” Policymakers in State B may wish to take action, but they will be unable to control pollution created in State A without State A’s cooperation. Even where polluting activity imposes substantial environmental harm within State A, the externalization of a portion of the harm is likely to result in the adoption of less optimal environmental controls.

#### No link turns – knee-jerk defenses of Parker on federalism grounds are under-theorized – the aff’s links are more robustly aligned with federalism

Meese 21 [Alan J. Meese, Ball Professor of Law, William & Mary Law School and Co-Director, William & Mary Center for the Study of Law and Markets. 16 Va. L. & Bus. Rev. 115, Fall 2021, Lexis]

The Court has repeatedly and unanimously claimed that considerations of "federalism and state sovereignty" justify state action immunity and thus counsel against Sherman Act preemption of state-imposed or state-authorized restraints. Numerous scholars agree. In particular, the Court and its academic defenders claim that applying the Act to state-imposed restraints would unduly interfere with states' ability to serve as laboratories of democracy, choosing how to regulate their own economies, contrary to the principles of federalism. The vast post- Wickard reach of the Sherman Act reinforces this argument, by facilitating application of the Act to local restraints - including those imposed by state governments - that produce no interstate harm. Indeed, aside from Parker itself, all state action controversies that have reached the Supreme Court, including the Court's most recent pronouncement on the topic, involve local restraints that produce harm confined to a single state. 17 Thus, some have claimed that, given the expansive scope of the Sherman Act, application of the Act to state-imposed restraints would implicitly resurrect the Lochner era, during which the Court invalidated state legislation that unduly restricted private economic autonomy. The state action doctrine, it is said, leaves regulatory choices over local economic activity where they belong, with the people's elected representatives instead of federal judges.

Although the Court decided Parker more than seven decades ago, the "federalism and state sovereignty" rationale for state action immunity remains under-theorized. Some academic articulations of this rationale invoke the Constitution itself, suggesting that preemption of state-imposed restraints [\*121] would be unconstitutional. Other articulations by the Court and scholars vaguely invoke "federalism," "state sovereignty," or both, without claiming that the Constitution prevents Sherman Act preemption of state-imposed restraints. Some scholars have suggested that Parker reflects the application of a federalism canon, albeit without identifying any particular canon. Thus, objective evaluation of Parker's state action defense requires scholars to identify the doctrinal vehicles through which federalism and state sovereignty might influence the meaning of the Act and to determine whether Parker and its progeny constitute faithful application of such principles.

This article evaluates and rejects the claim that considerations of federalism and state sovereignty somehow rebut the strong case for Sherman Act preemption of state-imposed restraints. Instead, consistent application of federalism principles bolsters the case for preemption of state-imposed restraints, like those in Parker, that directly burden interstate commerce and impose interstate harm. At the same time, considerations of federalism also counsel retraction of the scope of the Act and concomitant allocation to the states of exclusive authority over restraints that produce only intrastate harm. The resulting allocation of authority over trade restraints would nearly eliminate the potential conflicts between local regulation and the Sherman Act, conflicts that many claim justify the state action doctrine.

The article identifies two broad categories of arguments that supposedly support the state action doctrine. First, Parker's proponents could claim that one or more constitutional doctrines that protect federalism or state sovereignty somehow prohibit outright Sherman Act preemption of state-imposed restraints. Second, these proponents could argue that such considerations find expression in one or more canons of statutory construction and thereby militate against reading the Sherman Act to preempt such restraints, despite Congress's admitted authority to do so.

The article evaluates the arguments in each category and finds all such arguments wanting. Beginning with the first category, the article demonstrates that no doctrine of constitutional law requires Parker's state action doctrine. Indeed, the Supreme Court has repeatedly concluded that the Framers and Ratifiers adopted the Commerce Clause precisely because of their experience with state-imposed restraints that unduly burdened interstate commerce and imposed harm on out-of-state citizens. According to this historical account, the Clause was designed to empower Congress to prohibit such parochial state legislation, thereby removing barriers to a well-functioning national market and establishing free trade as the rule governing interstate commercial activity.

[\*122] While affirmative statutory preemption was relatively rare during the Nineteenth and early Twentieth Centuries, the Supreme Court read the Commerce Clause to authorize implied preemption of otherwise valid state legislation that directly burdens interstate commerce. Moreover, as the scope of the power has expanded over the past several decades, Congress has repeatedly exercised this authority to preempt state laws regulating local matters in numerous settings. To be sure, independent considerations of state sovereignty can constrain Congress's exercise of the commerce power. However, Sherman Act preemption of state-imposed restraints does not interfere with a state's organization or regulation of itself, officers, or employees and thus does not interfere with any cognizable aspect of state sovereignty protected by the Tenth Amendment, Eleventh Amendment, or inferred from the structure of the Constitution. Thus, preemption of state-imposed restraints like those challenged in Parker is a garden-variety exercise of Congress's commerce power.

To evaluate arguments in the second category, the article identifies three canons of statutory construction that could serve as vehicles for implementing concerns regarding federalism and state sovereignty: (1) the avoidance canon; (2) the federal-state balance canon, and (3) the anti-preemption canon. None of these canons, it is shown, supports Parker's state action doctrine. The article concludes that Sherman Act preemption of state-imposed restraints is so plainly constitutional that the avoidance canon is simply inapposite. The article then applies the federal-state balance and anti-preemption canons. Both canons protect traditional state regulatory spheres from inadvertent national intrusion, whether by regulation of local private conduct or preemption of state exercise of historic police powers. Far from bolstering the state action doctrine, the application of these two canons reveals that Parker's invocation of federalism and state sovereignty is selective, purporting to solve a problem that the Court itself created. Consistent application of these canons and the federalism principles that inform them actually strengthens the case for Sherman Act preemption, albeit within a much narrower sphere than the Sherman Act currently operates. The federal-state balance canon addresses statutory regulation of private conduct and thus does not speak directly to state action cases such as Parker, where a state itself displaced free competition. 18The canon could, however, apply to hybrid restraints, private agreements encouraged or enforced by the [\*123] state. Academic and judicial proponents of the state action doctrine have expressed concern about possible Sherman Act preemption of state and municipal regulation, including hybrid restraints, of local activities that produce no interstate harm. Such federal oversight, they say, would deprive state and local governments of their status as laboratories of democracy that try out novel solutions, such as hybrid restraints, to local problems. Application of the federal-state balance canon to prevent preemption of laws authorizing such restraints would apparently vindicate these concerns. However, such concerns have much wider application than Sherman Act treatment of state-imposed or state-encouraged restraints. If states are to be sovereign laboratories that experiment with novel solutions to economic problems, they must also retain discretion regarding how to regulate all private restraints - not just hybrid restraints - that produce no interstate harm. Indeed, principled application of the federal-state balance canon would have required the Court to reject the post- Wickard expansion of the Sherman Act to reach all private restraints that produce no interstate harm. The Court instead ignored this canon, vastly expanding the reach of the Act vis a vis private restraints the state has not authorized. This expansion raised the prospect of Sherman Act preemption of local regulation, including regulation authorizing hybrid restraints. Parker and its progeny thwarted such preemption, protecting - to this extent anyway - traditional state regulatory prerogatives. Consistent application of the federal-state balance canon offers a different and more principled solution, namely, restoration of the pre- Wickard boundary between state and federal power over trade restraints and retraction of the scope of the Sherman Act. Such revision of the boundaries between state and federal authority over such activity would nearly eliminate the potential clash between the Sherman Act and local regulation that purportedly induced Parker and its progeny to announce and maintain the state action doctrine. States would remain free to act as laboratories with respect to such restraints, unmolested by the Sherman Act. Restoration of the original federal-state balance in the antitrust context would not eliminate the prospect of Sherman Act preemption of state-imposed or state-encouraged restraints. States could authorize hybrid restraints that directly burden interstate commerce, thereby injuring out-of-state consumers. However, Sherman Act invalidation of such restraints would in fact protect the original federal-state balance, by interdicting the sort of direct burdens on interstate commerce preempted by the Court's pre- Wickard Commerce Clause jurisprudence. The anti-preemption canon fares no better as a justification for the state action doctrine. To be sure, this canon establishes a presumption against [\*124] applying federal statutes in a manner that supersedes the exercise of "historic police powers" over "an area traditionally regulated by the states." However, this canon would not protect the scheme in Parker itself. The scheme in no way exercised historic police powers but instead regulated a domain - interstate commerce - over which Congress traditionally possessed exclusive authority. California's regulation of the price of interstate raisin sales produced substantial interstate harm and thus would not have survived the doctrine of implied preemption in place when Congress enacted the Sherman Act. Preemption of the Parker scheme would have restored the traditional federal-state balance, by invalidating self-interested legislation that directly burdened interstate commerce and imposed substantial harm on out-of-state citizens. What, though, about Parker-like regulation that produces only intrastate harm? Sherman Act preemption of such restraints would certainly interfere with the exercise of historic police powers. Here again, however, application of the anti-preemption canon would solve a problem the Court itself created when it ignored the federal-state balance canon and applied the Sherman Act to private restraints that produced no interstate harm. As noted above, however, principled application of federalism concerns as reflected in the federal-state balance canon would preclude application of the Sherman Act to such restraints - public or private. Restoration of the Sherman Act to its original and more limited scope would eliminate the putative conflict between federal antitrust law and local regulation producing no interstate harm and thus obviate any need to apply the anti-preemption canon. Application of both federalism canons reveals that federalism in this context should be an all-or-nothing proposition. Consistent regard for federalism requires uniform treatment of private contracts "in restraint of trade" and state-imposed restraints that produce the same results. There are two possible forms of consistent treatment: (1) invalidation of all such local restraints, public or private, "across the board," or (2) reducing the scope of the Sherman Act, so that the Act only reaches those restraints - public or private - that produce interstate harm. Recognition that the Court's Sherman Act jurisprudence reflects inconsistent regard for federalism does not itself reveal which consistent approach the Court should take. The article ends by identifying several considerations suggesting that the Court should resolve the modern inconsistency in favor of federalism. Consistent reduction in the scope of the Sherman Act would produce a regime governing interstate commerce that best replicates the regulatory framework that the 1890 Congress - jealous to protect free competition from all threats - anticipated. Proponents of Parker [\*125] who see states as laboratories for economic experimentation should welcome such reform, which, ironically, would result in less preemption of state-created restraints than current law. Part I of this article reviews the content and scope of the Sherman Act during the pre- Wickard era, when the Supreme Court enforced meaningful limits on the scope of the commerce power and the Sherman Act. Part II describes the facts and holding of Parker as well as subsequent decisions elaborating on the scope of state action immunity. This part also details the considerations of federalism and state sovereignty that both the Court and academic proponents of Parker have invoked. Part III reviews the federalism-based objections to Sherman Act preemption that several scholars have raised. Part IV evaluates and rejects the constitutional arguments against such preemption. Part V evaluates and rejects claims that certain canons of statutory construction counsel in favor of Parker's state action immunity. This part concludes that Parker and its progeny rest on a selective respect for federalism and concludes that a principled Sherman Act jurisprudence would consistently enforce or ignore federalism considerations. Part VI briefly contends that the Court should resolve modern doctrinal inconsistency in favor of federalism and reform the scope of the Sherman Act accordingly.

I. The Commerce Power and the Sherman Act: 1890-Present

Passed in 1890, Section 1 of the Sherman Act forbids "contracts, combinations ... and conspiracyies in restraint of trade or commerce among the several States ..." 19Section 2 prohibits monopolization of any "part of the trade or commerce among the several States." 20Each Sherman Act controversy thus requires courts to resolve two questions. Under Section 1, courts must ask: (1) Is the challenged agreement "in restraint of trade" and (2) does the agreement also restrain "commerce among the several States." 21Under Section 2, courts must ask: (1) does the challenged conduct "monopolize" a relevant market and (2) is that monopolized market "part of the trade or commerce among the several States." 22 [\*126] The Sherman Act was an exercise of the commerce power, and Congress drafted the Act against the backdrop of a well-developed jurisprudence defining the scope and nature of that authority. 23While Congress rarely exercised this power before 1890, the Supreme Court had enforced what became known as the "dormant" Commerce Clause. 24The Court constructed a quasi-statutory framework that invalidated all state legislation that regulated "inherently national" subjects of interstate commerce, even absent Congressional action. 25These decisions inferred from Congressional silence that Congress intended that such subjects be "free and untrammeled" from state regulation. 26 State legislation "regulated" such commerce and thus exercised an exclusive power of Congress if it imposed a "direct burden" on such commerce. 27Impacts were "direct" if they imposed economic harm on citizens in other states, raising the prospect that state regulation would produce self-interested results. 28Legislation that impacted such commerce only "indirectly" exceeded the scope of the commerce power and thus survived this regime. 29The result was the allocation of regulatory authority into mutually exclusive spheres, enforced by a doctrine of implied preemption that invalidated state enactments exercising authority reserved for Congress. 30 [\*127] The Court's earliest Sherman Act decisions drew upon this jurisprudence to answer both questions necessary to resolve Sherman Act controversies. 31Agreements were "in restraint of trade" if they directly impacted commerce by producing supracompetitive prices. 32Such agreements only restrained "commerce among the several States" if these direct impacts injured out-of-state consumers. 33Indeed, in Addyston Pipe & Steel Co. v. United States, the Court opined that the Commerce Clause authorized Congress to regulate private agreements producing such direct effects because these restraints produced the same impact on interstate commerce as analogous state-imposed restraints deemed invalid under the Court's Commerce Clause precedents. 34 In 1911, the Court famously reformulated its interpretation of "restraint of trade," in Standard Oil v. United States. 35There the Court held that the Sherman Act only reaches agreements or conduct that restrain trade "unreasonably." 36Soon thereafter, the Court announced that this same standard governed Section 2 analysis. 37Although a different verbal formulation, this Rule of Reason, like the direct/indirect standard, focused on the propensity of a restraint or conduct to produce monopoly or the consequences of monopoly, namely, higher prices, reduced output, or inferior quality. 38However, the Court retained the direct/indirect standard for [\*128] answering the second question posed in Sherman Act controversies, that is, whether a contract in restraint of trade or monopolistic conduct also restrained "commerce among the several States" or monopolized any "part" of "trade or commerce among the several States." 39Thus, the Act reached only those unreasonable restraints or monopolistic conduct that also directly burdened interstate commerce by exercising market power to the detriment of out-of-state consumers. 40 By 1911, then, the Rule of Reason, combined with the direct/standard governing the Act's scope, protected "the free movement of trade ... in the channels of interstate commerce" 41or, as the Court soon put it, "free competition in interstate commerce," from private restraints. 42At the same time, the Court's quasi-statutory Commerce Clause jurisprudence invalidated state legislation that imposed "direct burdens" on interstate commerce. 43This coherent legal regime protected free interstate trade from threats posed by the self-interested public and private actors. 44Implementation of each regime required the Court to ask the same economic question when applying the direct/indirect standard, viz., did the challenged private conduct or legislation directly obstruct or burden interstate commerce. This regime left states and private parties free to adopt regulations or restraints that imposed [\*129] indirect burdens on such commerce, as such provisions posed no threat to out-of-state consumers. This unified competition-protecting regime survived into the 1930s, invalidating private and public direct burdens on interstate commerce. 45Indeed, the Court had no occasion to consider whether the Sherman Act preempted state legislation that directly burdened interstate commerce precisely because the Court's quasi-statutory Commerce Clause jurisprudence itself preempted such restraints, rendering any Sherman Act involvement superfluous. The Court adjusted application of the direct/indirect standard over time in light of changed facts that suggested the existence of interstate harm that prior Courts had not perceived. 46For instance, early decisions, such as United States v. E.C. Knight, held that the Sherman Act did not reach intrastate monopolies, even if such firms sold products across state lines. 47However, beginning with Standard Oil, the Court read the Act (and the commerce power) to reach activities that, while nominally local, "directly" affected interstate commerce by exercising market power to the detriment of out-of-state consumers, narrowing E.C. Knight accordingly. 48While the effective reach of the commerce power and the Sherman Act changed, the interstate harm principle that governed the boundary between state and national power - and the concomitant economic inquiry - remained fixed and unchanging. 49A robust regime of competitive federalism generated regulatory policy, including antitrust policy, governing economic activity that [\*130] produced no interstate harms and thus fell within the exclusive authority of states. This coherent regime and resulting allocation of regulatory power did not survive the 1940s. In Wickard v. Filburn, the Supreme Court famously jettisoned the direct/indirect test as the standard governing the scope of the commerce power, claiming that the standard was mechanical, formalistic and unduly restricted the authority of Congress. 50Instead, the Court said: the Commerce Clause empowered Congress to reach any activity that produced a "substantial economic effect" on interstate commerce, even if the effect was incidental or indirect. 51This novel standard empowered Congress to regulate conduct that produced no interstate harm and thus could not prompt legislation favoring a state's citizens over those of other states. 52 Wickard also implied that state and federal power over local activity was coextensive and thus not mutually exclusive, as the Court had previously maintained for several decades. 53 Wickard was not an antitrust case. However, before the decade was out, in Mandeville Island Farms v. American Crystal Sugar, the Court engrafted Wickard's substantial effects test onto the Sherman Act, overruling five decades of precedent. 54As a result, the Act reached any restraint of trade that induced a "substantial effect" on interstate commerce, even if the restraint's harms were confined to a single state. The Court has applied the Act to intrastate conspiracies between liquor wholesalers, 55a monopolistic scheme to prevent expansion of a single hospital, 56an agreement between lawyers setting title search fees in one county, 57and a trade association's conspiracy to restrict entry by subcontractors working on local building projects. 58 [\*131] Most recently, the Court affirmed the Federal Trade Commission's condemnation of an agreement excluding some individuals from the practice of teeth whitening in one state. 59The Commission had found that the challenged conduct substantially impacted interstate commerce because some affected firms purchased out-of-state equipment and supplies. 60Numerous other decisions have also involved restraints that produced harmless but fortuitous interstate effects. 61 Mandeville Island Farms read a novel principle into the Act, a principle that authorized application of the statute to restraints that threatened no interstate harm. While initially developed to govern private restraints, Mandeville Island Farms' substantial effects test created broad potential to interdict state-imposed restraints of local trade previously deemed beyond the commerce power. 62

II. Parker and its Progeny

Parker v. Brown evaluated the post- Wickard claim that the Sherman Act preempted anti-competitive state regulation. This part describes the facts and holding of Parker as well as subsequent decisions expanding the scope of state action immunity and elaborating upon its rationale. The part ends by detailing the considerations of federalism and state sovereignty that both the Court and academic proponents of Parker have invoked. A. Parker v. Brown Decided shortly after Wickard but before Mandeville Island Farms, Parker v. Brown considered a challenge to California's "Agricultural Prorate Act," as applied to the state's raisin industry. 63The Court properly described the Act as an effort to "restrict competition among growers and maintain prices in the distribution of their commodities to packers[.]" 64The statute empowered a State Agricultural Prorate Commission to propose to growers so-called "pro-rate marketing plans" limiting output and thus raising the prices of agricultural commodities. Proposals became law if 65 percent of growers owning 51 percent or more of acreage devoted to a particular crop voted to approve it. California farms produced 100 percent of the nation's raisin output, and imports accounted for one-sixth of one percent of national raisin consumption. 65Growers generally sold their output to local "packers," who packaged the raisins and sold 90-95 percent to out-of-state purchasers. 66In 1940, the Commission proposed and producers adopted a raisin pro-rate plan. The plan required the state's growers to deliver 70 percent of their output of "standard raisins" to a "program committee" which could only sell raisins at "prevailing market prices" or hold them off the market indefinitely. 67Growers were free to sell the remaining crop through "ordinary commercial channels" at whatever price they wished, albeit only after purchasing a "marketing certificate" authorizing such sales. 68The Act imposed civil penalties, fines and/or imprisonment for violation. 69Thus, the Act coercively replaced the pre-existing regime of free competition between private individuals with market outcomes determined by the State. A dissenting farmer who was both a grower and a packer challenged the program under the Commerce Clause and the Sherman Act. 70The plaintiff [\*133] sought to enjoin officials from enforcing the Act against him, thereby allowing him to continue setting whatever price and output maximized his profits in a free market. 71He argued that such equitable relief was necessary because the Act's "unusual, oppressive and unreasonable" criminal penalties deterred him from waiting to be prosecuted under state law before invoking the Commerce Clause and Sherman Act as "defensive tactics," i.e., as affirmative defenses. 72In short, the plaintiff invoked two possible sources of federal preemption: the Sherman Act and the Commerce Clause. 73 Writing before Wickard, a three-judge district court enjoined the Act. 74The court held that the Prorate Act, while regulating local activity, directly burdened interstate commerce and thus contravened the quasi-statutory regime of implied preemption derived from the Commerce Clause. 75The court invoked with approval various decisions implementing the pre- Wickard regime dividing authority over commercial subjects between states and the national government. 76Given the court's Commerce Clause holding, it did not address the Sherman Act. 77 California appealed to the Supreme Court, which, after oral argument, ordered re-argument and additional briefing, including from the United States [\*134] as Amicus Curiae, on the possible application of the Sherman Act. 78In a brief co-authored by antitrust hawk Thurmond Arnold, the United States argued that both the Sherman Act and the quasi-statutory regime derived from the Commerce Clause preempted California's scheme. The whole point of the Act, the government said, was to ensure that "competition, not combination, should be the law of trade." 79The "end sought," the government continued, was "the prevention of restraints of free competition in business and commercial transactions, which tended to restrict production, raise prices or otherwise control the market to the detriment of purchasers of goods or services." 80While the Sherman Act did not expressly refer to state enactments, the Court's precedents established that a federal statute preempted any state law "that stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress." 81 Invoking pre- Wickard antitrust decisions applying the direct/indirect standard, the government contended that California's regulation of local activity, in fact, monopolized the national raisin market and thus increased ( i.e. regulated) the price of raisins sold in interstate commerce. 82There was "no doubt," the government said that "the plan involved in this case controls the market price," which increased thirty percent one year after the adoption of the scheme. 83It did not matter that the growers sold their output to California packers. 84Sherman Act precedent established that agreements to "restrain or control the supply ... entering and moving in interstate commerce" were "a "direct violation'" of the Act. 85Because the plan reduced output and increased the prices paid by packers, the scheme would "undoubtedly directly affect and restrain the supply and price of raisins in interstate commerce." 86The pro-rate plan was "inconsistent with the policy embodied in the Sherman Act" and thus preempted. 87 [\*135] The government's Commerce Clause argument echoed similar themes. "Inherently national subjects" of interstate commerce, the government said, were subject to exclusive congressional control. 88The Court's precedents "regarded as a matter of great consequence whether the burden of a statute fell primarily upon persons outside of the regulating state." 89"If anything was of national commercial importance," the government continued, "the supply and price level of a commodity moving in interstate commerce falls into that category." 90Moreover, the program plainly regulated that subject, granting to a state agency the power to "monopolize the entire national supply of raisins, determine the quantity to be shipped in interstate commerce, and to control the interstate price structure." 91The benefits of the scheme "accrued to California Producers," with the result that "the action of the state is not likely to be subjected to the normal political restraints upon legislation." 92The program did not merely govern a matter of local concern but instead "determined the quantity of raisins which may go to market - and the market is the national interstate market." 93Based on these and other considerations, the government concluded, "the California raisin program is unconstitutional." 94 A unanimous Court rejected both challenges. The Court properly assumed that the Sherman Act would condemn such a program if adopted and enforced solely by private agreement. 95While the scheme limited the output of "local" crops, the resulting harm fell almost entirely on out-of-state [\*136] citizens. These direct and predictable interstate harms justified application of the Act to nominally "local" conduct, even under pre- Wickard precedents. 96 Beginning with the Sherman Act, the Court conceded for the sake of argument that Congress could preempt state-imposed restraints like California's plan. 97In particular, the Court noted with approval several decisions holding that Congressional legislation had occupied a "legislative field" and thus "suspended" state laws. 98Suspension, of course, was synonymous with preemption, and such decisions exemplified what the Court now calls "field preemption." 99The Court did not mention decisions invoked by the United States recognizing "conflict preemption," which invalidated state laws creating obstacles to the accomplishment of federal objectives. 100 Still, the Court found that the Sherman Act did not "suspend" California's pro-rate plan. The plan was not, the Court said, a private agreement but "derived its authority and its efficacy from the legislative command of the state, and was not intended to operate or become effective without that command." 101Neither the Act's language nor its legislative history, the Court said, evinced any purpose "to restrain a state or its officers or agents from activities directed by its legislature." 102 [\*137] The Court expressly invoked federalism considerations to support this conclusion, contending that the Constitution's division of sovereignty between national and state governments counseled against application of the Sherman Act to such restraints: In a dual system of government in which, under the Constitution, the states are sovereign save only as Congress may constitutionally subtract from their authority, an unexpressed purpose to nullify a state's control over its officers and agents is not lightly to be attributed to Congress. 103 The statute's legislative history contained no indication that the Act would apply to such state action, the Court said, and the main sponsor of the bill, Senator Sherman, had asserted that it "prevented only "business combinations.'" 104 Having rejected the Sherman Act challenge, the Court went on to reverse the lower court's Commerce Clause holding that invalidated the scheme. 105The Court conceded that California's regulation of "matters of local concern" was "so related to interstate commerce that it also operated as a regulation of that commerce," that is, the interstate sale of raisins. 106Under pre-1890 (and pre- Wickard) case law, this conclusion that a state was regulating the price of interstate transactions or transportation sufficed to invalidate the scheme. 107However, Congress had not, the Court said, exercised its commerce power (given the Court's Sherman Act holding!), with the result that the Court [\*138] should "reconcile[]" Congressional and state power. 108Such "reconciliation," the Court said, required "the accommodation of competing demands of state and national interests involved." 109 Analogizing to Wickard, the Court rejected the direct/indirect standard for assessing the validity of the restraints, signaling that even direct restraints of interstate commerce could survive Commerce Clause scrutiny. 110The inquiry was not, the Court said, whether the restraint was "direct," (as it assuredly was), but instead whether "the matter is one which may appropriately be regulated in the interest of safety, health and well-being of local communities and, because of its local character, and the practical difficulties involved, may never be adequately dealt with by Congress." 111Because of the activity's "local character," the Court said, there might be a "wide scope for local regulation without substantially impairing the national interest in the regulation of commerce by a single authority and without materially obstructing the free flow of commerce." 112The Court did not explain why the impact of California's self-interested control over the nation's entire raisin supply was "immaterial." 113Nor did it mention various decisions invalidating state regulation of the price and output of products subsequently sold across state lines because they "directly impacted" such commerce. 114 The Court confined its Sherman Act holding to state-imposed restraints on market actors. Such restraints coercively restricted the rights of individuals to engage in the sort of free competition the Sherman Act [\*139] ensures. 115By contrast, the Court said, a state could not "give immunity to those [private parties] who violate the Sherman Act by authorizing them to violate it, or by declaring that their action is lawful." 116Nor, Parker said, could a state participate in otherwise unlawful agreements or combinations with private parties. 117The Court thereby conceded that the Act would preempt some state laws, presumably because such state endorsed conduct or conduct of the state itself would nonetheless conflict with federal law. 118 Thus was born antitrust's "state action doctrine," whereby state-imposed restraints of interstate commerce are "immune" from the Sherman Act, regardless of their economic effects. 119 Parker has remained good law without question for more than seven decades, despite the Court's flexible approach to stare decisis in the antitrust context. 120 B. Parker 's Progeny: Hybrid and Municipal Restraints While Parker purported only to immunize restraints imposed by "a state or its officers or agents," subsequent decisions expanded the doctrine. These cases protected restraints that private parties adopted pursuant to otherwise valid state regulatory programs, reasoning that the threat of private antitrust liability would deter parties from participating in such schemes. 121Indeed, [\*140] some such regimes require all parties in a particular industry to adhere to prices set by a subset of the industry's firms. 122For instance, a statute might require liquor dealers to set retail prices equal to wholesale prices plus a specified mark up. 123Some scholars have dubbed such agreements "hybrid restraints," whereby "the government empowers private firms to make choices, or to exercise discretion, as to the nature or level of consumer injury." 124Such restraints "cede[] to private actors "a degree of private regulatory power' that results in a restraint of trade" 125States can immunize such private restraints from the Sherman Act, and thus escape preemption, if: (1) the legislature clearly articulates a policy to restrict competition and (2) the state "actively supervises" the outcomes ( e.g. price and output) of resulting restraints. 126The liquor regulation just described would satisfy the first part of this test because the state has expressly supplanted competition. Thus, the scheme's validity would depend upon how closely the state scrutinized resulting prices. 127 Such "hybrid" restraints are a small subset of the universe of unreasonable private restraints. Indeed, states' own antitrust laws generally ban unreasonable private restraints. 128When it comes to private restraints, hybrid restraints are the exception and not the rule. [\*141] The Court has applied a similar regime to restraints imposed by municipalities, holding that such entities do not possess the sovereignty possessed by states. 129Restraints imposed by municipalities are fully subject to the Sherman Act, unless the state has clearly articulated a policy displacing competition. 130There is, however, no "active supervision" requirement for such restraints. 131 Thus, Parker and its progeny recognize three distinct types of state-created restraints that thwart free competition but may still escape Sherman Act preemption. First, there are cases like Parker itself, where states coercively displace free competition, expressly setting price or output. Such restraints are without exception immune from the Act, and thus escape preemption. Second, there are hybrid restraints, where the state authorizes or compels private actors to engage in anticompetitive behavior. 132These restraints are immune from the Act if the state satisfies the elements of clear articulation and active supervision. Third there are those cases where a municipality coercively displaces free competition. 133Such restraints are immune if the state satisfies the "clear articulation" requirement. 134 Failure to establish the prerequisites of state action immunity for hybrid or municipal restraints results in two legal consequences: (1) Sherman Act liability for private parties who comply with such restraints and (2) preemption of state or local enactments that authorize or compel such agreements. 135It will be useful to distinguish between these categories of [\*142] state action immunity when evaluating the arguments against preemption of state interference with free competition.

C. The Federalism and State Sovereignty Rationales for the State Action Doctrine

The Court has repeatedly reiterated the federalism and state sovereignty rationales for Parker and its progeny , invoking Parker's reference to our "dual system." 136If anything the Court has increased the emphasis on these rationales for the doctrine; modern decisions identify no other normative justification. It is no surprise that jurists supportive of these values in other contexts have invoked such considerations. 137However, jurists hostile to such values in other contexts have also endorsed Parker and its progeny on identical grounds. 138

Numerous scholars have endorsed Parker's understanding of the Sherman Act. 139

[Footnote 139] See, e.g., William H. Page & John E. Lopatka , Parker v. Brown, the Eleventh Amendment, and Anticompetitive State Regulation, 60 WM. L. REV . 1465, 1472 (2019); James R. Saywell, The Six Sides of Federalism in North Carolina Board of Dental Examiners v. FTC, 76 OHIO ST. L. J. FURTHERMORE 1, 4-9 (2015); Jean Wegman Burns, Embracing Both Faces of Antitrust Federalism: Parker and ARC America Corp., 68 ANTITRUST L. J. 29, 38 (2000); Merrick B. Garland, Antitrust and State Action: Economic Efficiency and the Political Process, 96 YALE L. J. 486 (1987); William H. Page, Antitrust, Federalism, and the Regulatory Process: A Reconstruction and Critique of the State Action Exemption, 61 B.U.L. Rev. 1099, 1101 (1981); Handler, supra note 118, at 19-20; Paul R. Verkuil, State Action, Due Process and Antitrust: Reflections on Parker v. Brown, 75 COLUM. L. REV. 328 (1975).

These scholars echo Parker's invocation of the nation's "dual system" [\*143] and contend that Sherman Act preemption of state-created restraints would trench unduly upon what they characterize as "constitutional" values of state sovereignty and federalism. 140

[Footnote 140] See Page & Lopatka , supra note 139, at 1468-69; Saywell, supra note 139, at 4-9; Burns, supra note 139, at 38-39 (invoking Supreme Court decisions recognizing the "fundamental dual-government structure of the Federal Constitution" to justify Parker); id. (contending that the "dual structure of the federal Constitution ... "requires that Congress treat the States in a manner consistent with their status as residuary sovereigns and joint participants in the governance of the Nation [sic].'") (quoting Alden v. Maine, 527 U.S. 706, 709 (1999)); id. at 38 ("When applied to antitrust, these [recent federalism] rulings make crystal clear that, as a practical matter, antitrust federalism is here to stay. Even if Congress tried to override or limit the Parker shield, such an attempt likely would fail."); Page, supra note 139, at 1102-1107 (describing and endorsing "constitutional basis of the Parker doctrine"); id. at 1128-30 (contending that "active supervision" requirement for hybrid restraints contravenes Parker's constitutional foundation); James F. Blumstein & Terry Calvani, State Action as a Shield and a Sword in a Medical Services Antitrust Context: Parker v. Brown in Constitutional Perspective, 1978 DUKE L. J. 389, 419-24 n.193 (grounding state action doctrine in Tenth Amendment case law); Mark L. Davidson & Robert D. Butters, Parker and Usery: Portended Constitutional Limits on the Federal Interdiction of Anticompetitive State Action, 31 VAND. L. REV. 575, 597-604 (1978) (same); Handler , supra note 118, at 7 n.35 (contending that preemption of state-imposed restraints would "breach[] the basic tenets of the federalism upon which rests our constitutional form of government."); id. at 15 (contending that Sherman Act scrutiny of such restraints "is plainly at war with the fundamental principles of American federalism"); see also Brief Amicus Curiae for the Am. Dental Ass'n, N.C. Bd. of Dental Exam'rs v. FTC, 574 U.S. 494 (2015) (No. 13-534) (criticizing preemption of state's anticompetitive regulation as "trampling upon the sovereignty of the states in our federal system"); Allensworth , supra note 62, at 1402-04 (discussing academic literature contending that Parker rests on constitutional limits on Congress's authority to override state regulation).

Several have also elaborated upon Parker's rationale, contending that the Constitution contemplates that states should be entitled to "regulate their own economies." 141

Several such scholars argue that post- Wickard expansion of the Act to reach local restraints producing no interstate harm bolsters the case for immunity. 142Reversal of Parker, they say , would ensure federal antitrust [\*144] scrutiny of innumerable garden-variety police power regulations, many governing purely local subjects, because such regulations restrain activity with fortuitous but substantial impacts on interstate commerce. 143Federal judicial scrutiny of local regulation would, it is said, replicate the supervision of state economic regulation under the Due Process Clause during the Lochner era. 144These fears have a strong empirical basis. Aside from Parker itself, every Supreme Court decision applying the state action doctrine has involved regulation of local activity that produced only intrastate harm. 145

According to several proponents of Parker, a well-functioning federal system requires states to serve as laboratories of democracy that experiment with various approaches to local economic problems. 146

[Footnote 146] See Saywell, supra note 139, at 7-8 (invoking laboratory metaphor to contend for relaxed definition of active supervision and broader Parker immunity); Burns, supra note 139, at 44 (contending that antitrust federalism, including Parker, protects the existence of "fifty state laboratories, in which ideas can be implemented and tested."); Handler, supra note 118, at 5-6 & n.26 ("To stay experimentation in things social and economic is a grave responsibility. Denial of the right to experiment may be fraught with serious consequences to the Nation. It is one of the happy incidents of the federal system that a single courageous State may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country.") (quoting New State Ice Co. v. Liebmann, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting)) ; see also Note, supra note 144, at 2561-62 (arguing that respect for states' role as laboratories militates in favor of respecting diverse state antitrust regimes).

The modern theory [\*145] of competitive federalism predicts that, under certain conditions, rivalry between such sovereigns can produce optimal legislation. 147Preemption, by contrast, would displace these laboratories as sources of novel economic policies responsive to local needs.

Indeed, some have argued that, properly understood, federalism and state sovereignty require more robust immunity from Sherman Act preemption. Some, for instance, have criticized the requirement that states "actively supervise" private parties' implementation of anticompetitive agreements. 148

[Footnote 148] See Saywell, supra note 139, at 6 ("The federal government must respect [state] sovereignty - not redefine it by requiring active supervision of a state's own agencies."); Page, supra note 139, at passim (criticizing this requirement as inconsistent with federalism); Handler, supra note 118, at 9 n.45 and 18 (criticizing proposals that would condition immunity on sufficient "state supervision").

Others contend that restraints imposed by municipalities should enjoy absolute immunity. 149These scholars contend that states should remain free to allocate authority between their respective subdivisions as they see fit, without satisfying procedural requirements imposed under the aegis of the Sherman Act. 150If Parker rests on respect for "federalism and state sovereignty," they say, the Court should respect the otherwise constitutional process that states employ to authorize localities and private parties to impose anticompetitive restraints. 151These arguments would immunize any restraint on competition that a state or its subdivision authorizes under a state's own [\*146] constitutional processes and shield such authorization from Sherman Act preemption. 152

Parker's proponents recognize that anticompetitive state legislation may sometimes impose economic harm on other states. 153Some contend that dormant Commerce Clause jurisprudence will interdict such enactments, obviating any need for Sherman Act intervention, while leaving states free to regulate local activity nominally within the scope of the Act. 154Any succor from the Commerce Clause appears illusory, however. Parker itself rejected the plaintiff's dormant Commerce Clause challenge, even though nearly all the harm produced by the challenged program fell on out-of-state consumers. 155None of these scholars has questioned that holding or identified any decision invalidating Parker-type restraints. Given Parker's deferential Commerce Clause review of state-imposed restraints, the Sherman Act is the only plausible source of preemption. 156Thus, these scholars effectively contend that each state's internal democratic processes should constitute the sole remedy for such wealth-destroying regulation, even when out-of-state voters bear most of the resulting harm. 157

[Footnote 157] See, e.g., Saywell , supra note 139, at 7-8 (contending that Sherman Act preemption of squelches local experimentation and innovation a deprives states of their position as laboratories); Page, supra note 139, at 1107 ("Deference to considered state economic choices thus constitutes the touchstone of the Parker doctrine. This approach draws doctrinal support from the Madisonian model of representative government and dictates judicial restraint as long as the "process of representation' affords interested parties an opportunity to influence the formulation of policy."); Handler, supra note 118, at 19 ("There are democratic processes by which unwarranted laxity of the states can be rectified."); id. at 20 ("I would not substitute preemption for substantive due process to achieve a federal censorship of state legislation; I would turn to the states as the forum for the correction of the mischief[.]").

III. Federalism-Based Objections to Sherman Act Preemption

As the United States explained in its Parker brief, state-imposed restraints of interstate commerce pose obstacles to achieving the central policy of the Sherman Act, namely, reliance upon free competition to allocate the nation's economic resources. 158To be sure, California's scheme imposed significant economic harm on out-of-state citizens, unlike nearly all other state-created restraints. 159However, Mandeville Island Farms expanded the object of the Act to include protecting free competition from local restraints producing no interstate harm. Straight-forward application of the Court's preemption doctrine would thus seem to establish that the Sherman Act preempts all state-created unreasonable restraints - regardless of interstate harm - that produce a substantial effect on interstate commerce, because they pose obstacles to achieving this objective. 160

However, some scholars and the Court contend that principles of constitutional federalism and state sovereignty bolster if not require Parker's rejection of Sherman Act preemption. 161Invocation of "federalism," or "state sovereignty," does not resolve concrete cases. Presumably such considerations must manifest themselves within some doctrinal frameworks, and not as a judicial talking point. The Sherman Act, after all, is a statute, and only the Constitution can restrict its reach.

Still, despite repeated claims that considerations of federalism and state sovereignty justify Parker's state action doctrine, neither the Court nor most of Parker's academic proponents have specified the nature of their federalism or state sovereignty concerns with doctrinal precision. 162

[Footnote 162] See, e.g., Handler, supra note 118, at passim (endorsing Parker without identifying any constitutional doctrine militating against preemption); id. at 7 n.35 (contending that preemption of state economic regulation would "breach[] basic tenets of federalism upon which rests our constitutional form of government is based.").

At best, some proponents have invoked the Tenth and Eleventh Amendments as possible [\*148] sources of such immunity, usually without elaboration. 163

[Footnote 163] See, e.g., Page & Lopatka , supra note 139, at 1468 (the Court has derived the Parker doctrine "from the principle of sovereign immunity"); Burns, supra note 139, at 38 (invoking Supreme Court's then-recent Eleventh Amendment jurisprudence as supporting Parker); Page, supra note 139, at 1105 n.36 (suggesting that Parker could be interpreted as resting upon "the eleventh amendment or, perhaps, ... the tenth amendment."); Davidson & Butters, supra note 140, at 597-604 (contending that Tenth Amendment case law justifies Parker's state action doctrine).

As a result, academic evaluation of the supposed federalism and state sovereignty rationales for Parker's rejection of preemption requires identification of possible doctrinal bases for such concerns, one or more of which could help justify Parker and its progeny.

Such concerns could manifest themselves in two broad categories. First, federal preemption of state-imposed restraints could be outright unconstitutional. 164

[Footnote 164] See Burns, supra note 139, at 38 (asserting that the Tenth and Eleventh amendments prevent Congress from expressly preempting local state legislation otherwise subject to the commerce power); Davidson & Butters, supra note 140, at 597-604.

Second, preemption of such restraints could contradict one or more canons of construction that courts employ to discern the original meaning of ambiguous texts. The remainder of this article will identify and then evaluate the possible arguments in these two categories that may conceivably militate against Sherman Act preemption of state-imposed restraints. As will be seen, evaluation of arguments in the first category will help inform evaluation of arguments that one or more canons of statutory construction justify Parker's interpretation of the Sherman Act.

#### The aff preserves state authority to enforce antitrust but absent clarification on the transboundary effects from broad Parker immunity turf wars cause enforcement failures

Kobayashi 20 [Bruce H. Kobayashi, George Mason University, Antonin Scalia Law School Professor, 10-4-2020 https://gaidigitalreport.com/2020/10/04/exemptions-and-immunities/#\_ftn92]

B. Spillover Effects and Antitrust Federalism

The current state action doctrine does not enable jurisdictional competition or promote the principles of federalism because it does not account for the spillover effects of anticompetitive state regulation. Judge Easterbrook examined the Court’s state action holdings and found that the Court’s rulings were indifferent as to whether the effects of the regulation were actually internalized by the regulating state.[91] Allowing states to enact anticompetitive legislation reduced the extent and effectiveness of competition among the states, and thereby increased the cost of exit and relocation.[92]

This nature of the spillover effect is exemplified in Parker v. Brown.[93] The state action doctrine was used to uphold a California regulation which authorized a raisin cartel. California raisin growers benefited greatly from that ability to price fix. However, over 90% of the grapes were exported outside of California—nationally and internationally—making the impact of the California raisin regulation reach beyond state lines.[94] The regulation harmed a large number of consumers outside of California while only benefiting a small number of private interest parties within the state.

State action doctrine, although meant to preserve that state’s independence, actually allows the state to reap the benefits of the anticompetitive regulation while displacing the costs onto other states.[95] Therefore, it is worth considering if the current state action doctrine should be thought of differently, in a way that fully takes into accounts issues of federalism. Judge Easterbrook proposes a state action rule which considers the spillover effect of anticompetitive state regulation. Instead of examining clear articulation and active supervision, the Court would uphold an anticompetitive state regulation as long as its anticompetitive effects are internalized by that state’s residents.[96] Aligning state action doctrine with the economics of federalism will not only maintain states’ roles in antitrust, but also ensure that state antitrust exemptions have a diminished negative impact on consumer welfare. Analyzing the anticompetitive overcharge of regulations is also more administrable than attempting to analyze the regulations under the dormant Commerce Clause.[97] Considered under Easterbrook’s approach, Parker’s California raisin prorate program would be subject to antitrust scrutiny because the regulation’s costs were not internalized.

State regulation of seemingly local competition is likely to effect more than just the economy of that specific state. When states grant antitrust immunities in situations involving interstate commerce, the state is exporting the anticompetitive effects of its regulations to citizens outside its own borders. Without accounting for the federal interest in an integrated national economy, state action doctrine far surpasses its narrow purpose of supervising local competition.

C. The Appropriate Role of State Attorneys General in Federal Antitrust Disputes

Federalism most often refers to the vertical relationship between the federal government and the states. Divergent viewpoints among antitrust enforcers can strain the system, thus comity and deference are crucial to efficient antitrust enforcement. A merger or acquisition is often scrutinized by multiple enforcers with multi-dimensional relationships.

For example, the Sprint/T-Mobile merger involved the Antitrust Division and Federal Communications Commission, who share a horizontal relationship, and state attorneys general, with which the federal agencies share a vertical relationship. Disagreement between enforcers may occur at either level.[98] The merger between the two telecommunications firms was cleared by the FCC, the Antitrust Division, and ten state attorneys general.[99] Although a settlement agreement—which required divestitures—was in the process of being approved, several other state attorneys general filed a lawsuit to block the merger anyway.[100] Assistant Attorney General Makan Delrahim questioned the relief sought by the states,[101] citing the federal agencies’ expertise in the matter.[102] He noted that “a minority of states and the District of Columbia” were “trying to undo [the nationwide settlement],” a situation he believed was “odd.”[103] Delrahim reaffirmed states’ rights to sue for antitrust violations but criticized their attempt to seek relief inconsistent with the federal government’s settlement.[104]

States may also enter settlement agreements with merging parties that are repugnant to sound antitrust enforcement. For example, in UnitedHealth Group/Sierra Health Services, the Nevada Attorney General required the merged firm to submit $15 million in charitable contributions which were not related to any antitrust violation.[105] Similarly, Massachusetts entered a settlement agreement with two hospitals that required increased spending on select programs and the creation of other projects and programs unrelated to antitrust concerns.[106]

On the other hand, state antitrust enforcement can play a useful role in supplementing federal antitrust enforcement. First, the use of state autonomy within a federal system allows state and local governments to act as social “laboratories,” where laws and policies are created and tested at the state level of the democratic system, in a manner similar (in theory, at least) to the scientific method.[107] Thus, even if states enter into agreements with merging parties that the federal authorities view as anticompetitive or that impose ineffective remedies for the anticompetitive effects that would be generated by the merger, the information generated by such actions can be invaluable inputs into retrospective analyses of the competitive effects of mergers. These analyses are based on causal empirical designs which require both observation of post-merger price and quality effects from consummated mergers and the ability to compare these effects with a credible control group.[108] For example, state interventions such as COPA or Certificate on Need Laws that allow hospital mergers that generate competitive effects in local geographic markets facilitate retrospective studies of hospital mergers that can be used to validate and improve the economic models and other tools used to predict merger effects.[109]

Second, in a system of federalism, the state enforcement of both the state and federal antitrust laws can be a valuable complementary resource that supplements scarce federal resources. Conflicts between the federal and state antitrust authorities are generated by the use of a cooperative or “marble cake” approach to federalism, where the tasks of the state and federal agencies are relatively undefined, overlapping, and imperfectly coordinated. In contrast, a “dual” or “layer cake” federalism approach, where power is divided ex-ante between the federal and state governments in clearly defined terms, can mitigate direct conflicts between state and federal authorities discussed above.

#### Enforcement high now and thumps links

Ingrassia 1-4 [John Ingrassia, Proskauer Rose LLP, 1-4-2022 https://www.law360.com/articles/1452119/how-to-navigate-the-coming-antitrust-policy-tests]

2021 will be remembered in antitrust law. Not since the 1970s has there been so much chatter over the fundamental purposes of antitrust policy, or such potential for actual sea change.

Half a century ago, Robert Bork and the Chicago School argued that antitrust law had lost its way and should focus on consumer welfare. Bork's view was that antitrust enforcement was getting in the way of legitimate competition, and the U.S. Supreme Court was quick to embrace the consumer welfare standard.

Now, Federal Trade Commission Chair Lina Khan and the new Brandeisians argue that antitrust law has again lost its way and must shed the constraints of the consumer welfare standard.

Khan's view is that consolidation has gone unchecked in the American economy, resulting in structural harms to competition that the consumer welfare standard is unable to address.

She believes the agency has historically defined markets too narrowly to effectively police broader economic impacts of sustained consolidation, and favored gerrymandered remedies over outright challenges.

Khan has imposed sweeping changes aimed at chilling merger activity and shaping the future of merger enforcement. Against dissents from Republican Commissioners Christine Wilson and Noah Phillips, and charge of going rogue from the U.S. Chamber of Commerce, the FTC stripped away long-standing exemptions and interpretations that streamlined merger review.

The action came in response to an unprecedented merger wave — 3,845 acquisitions filed with the agencies in the first 11 months of 2021, substantially more than most full years.

The changes are having an impact, making investigations more intrusive, lengthy and less predictable. Still, policy precedes practice, and while the FTC has been heavy on policy, it has yet to test those policies in the courts.

The tests may come in the next year. Meanwhile, we can also expect the FTC and the U.S. Department of Justice under Assistant Attorney General Jonathan Kanter's leadership, to not only continue the trajectory of policy changes but also begin the task of entrenching them in agency practice.

Here, we review the year in FTC policy moves, what they mean and how to navigate the newly laid minefields.

Warning Letters After the Close of HSR Waiting Periods

In an unprecedented move, the FTC recently began issuing letters to parties in transactions the agency may intend to investigate after expiration of the Hart-Scott-Rodino Act waiting period. According to the agency in an Aug. 3, 2021, blog, this is the result of "a tidal wave of merger filings that is straining the agency's capacity to rigorously investigate deals ahead of the statutory deadlines." Wilson, however, said on Twitter on Aug. 12, 2021, that she was "gravely concerned that the carefully crafted HSR framework is suffering a death by a thousand cuts," following her Aug. 9 statement that said "For the HSR Act to retain meaning, it cannot be that the FTC will keep merger investigations open indefinitely, as a matter of routine, every time there is a surge in filings." The FTC's jurisdiction to review transactions is independent of the HSR reporting requirements, with the power to investigate any transaction before or after closing, whether subject to reporting or not, and whether the HSR waiting period has expired or not. There are examples of the agencies reviewing nonreportable transactions, and even investigating reportable transactions after expiration of the HSR waiting period, though they are rare. The warning letters do not assert new authority not already existing under law, but notifying parties that an investigation may remain open post-HSR clearance implicates finality and certainty of investigations, but not every transaction gets a warning letter. Those with no issues go through unscathed. Those with clear issues are investigated. The deals that might pose some issues, but not enough to draw an investigation, might trigger the newly minted warning letter. To show the letters have teeth, the FTC will sooner or later have to challenge a deal post-HSR waiting period, putting it to the test before courts, where it is likely to face hurdles to the extent the deal did not warrant a full investigation in the first instance. Still, the practice is ushering a change in how provisions are drafted in deal documents. A buyer asserting that it is not required to close over the — arguably — still-pending investigation may face an uphill battle depending on how the closing conditions are drafted, for they typically point to the expiration of applicable waiting periods and not the absence of potential ongoing investigations or issuance of warning letters. So careful buyers seek closing requirements that no investigations are threatened and that no warning letters have been issued. Recent examples include the 3D Systems Corp.'s agreement to acquire Oqton Inc. and Universal Corp.'s agreement to buy Shank's Extracts Inc. The parties' agreements provided that if a warning letter is issued, the investigation would be treated as closed 30 days after receipt of such letter. Buyers may want to consider similar provisions until more emerges on how the FTC will proceed with warning letter transactions.

More Intensive Merger Investigations

The FTC announced plans on Aug. 3, 2021, to make the second request process both "more streamlined and more rigorous." The changes include the following: Merger investigations will address additional potentially impacted competition, such as labor markets, cross-market effects, and the impact on incentives of investment firms. Modifications to second requests will be more limited. The agency will require parties to provide more information relating to their use of e- discovery in responding to the investigation. Additional information will be required with respect to privilege claims. The FTC said these changes are in recognition that "an unduly narrow approach to merger review may have created blind spots and enabled unlawful consolidation." Possibly in response to such steeped up investigative techniques and resistance to find common ground with merger parties, Sportsman's Warehouse Holdings Inc. and Great Outdoors Group LLC abandoned their proposed merger at the end of 2021, citing indications that the FTC would be unlikely to approve the outdoor sporting goods transaction. The changes, though, do little to streamline the second request process. They make it more complex, burdensome and time-consuming. Perhaps most notable is the use of the process to delve into labor markets. Republicans Wilson and Phillips argued that FTC leadership may have themselves to blame for the merger review crunch, saying in a Nov. 8, 2021 statement: If the agency is lowering thresholds of concern and broadening theories of harm, this certainly would explain why the FTC is unable to conduct merger reviews in a timely manner while our sister agency remains capable of addressing the same increased filing volumes within statutory timeframes.

More Onerous Consent Decree Provisions

Where merger parties settle a challenge rather than litigate, the consent decree process sets out the parties' obligations. Historically, such consent decrees, among other things, required parties to notify the agency prior to certain future acquisitions. The FTC rescinded this long-standing policy, noting that it: Returns now to its prior practice of routinely requiring merging parties subject to a Commission order to obtain prior approval from the FTC before closing any future transaction affecting each relevant market for which a violation was alleged. The agency will also require divestiture buyers to agree to prior approval for any future sale of the assets they acquire. Khan explained the move was to avoid "drain[ing] the already strapped resources of the Commission" on "repeat offenders." The FTC included the new provision in its Oct. 25, 2021, consent decree settling a proposed transaction by DaVita Inc., a dialysis service provider. DaVita is now required to receive prior approval from the FTC of 10 years before any new acquisitions, a dialysis clinic business in Utah being in question. This is a significant change and will chill not only settlements with the FTC, but also M&A transactions at the outset where such provisions are commercially untenable. Wilson and Phillips noted in dissent that "a prior approval requirement imposes significant obligations on merging parties and innocent divestiture buyers." The FTC clearly aims to chill M&A activity, and merger agreements that provide more optionality to abandon deals will become more common, though parties intent on pushing their deal through may see a consent decree with 10-year approval provisions as less palatable than litigating, and force the FTC to cave or go to court.

Withdrawal of the Vertical Merger Guidelines

In another party-line vote, the FTC withdrew the vertical merger guidelines, which were issued just last year. Democratic commissioners criticized the guidelines as based on "unsound economic theories that are unsupported by the law or market realities," and reflecting a "flawed discussion of the purported procompetitive benefits (i.e., efficiencies) of vertical mergers." Vertical transactions are between firms at different levels in the supply chain. Historically, antitrust enforcement of exceptional vertical mergers were rare and difficult given the previously presumed efficiencies. Vertical mergers can eliminate double marginalization, in which firms at each level mark up prices above marginal cost. Elimination of one markup results in lower prices and can be pro-competitive. Khan, however, argues the guidelines' "reliance on [elimination of double marginalization] is theoretically and factually misplaced." Going forward, "the FTC will analyze mergers in accordance with its statutory mandate, which does not presume efficiencies for any category of mergers." This too drew a strong rebuke from the Republican commissioners, who said "The FTC leadership continues the disturbing trend of pulling the rug out under from honest businesses and the lawyers who advise them." The commission's challenges to chipmaker Nvidia Corp.'s $40 billion acquisition of U.K. chip design provider Arm Ltd. alleged the transaction would combine one of the largest chip producers with a firm that has essential design technology — critical inputs. In a Dec. 2, 2021, statement, the FTC said the acquisition "would distort Arm's incentives in chip markets and allow the combined firm to unfairly undermine Nvidia's rivals." The FTC's lawsuit should "send a strong signal that we will act aggressively to protect our critical infrastructure markets from illegal vertical mergers that have far-reaching and damaging effects on future innovations," FTC Bureau of Competition Director Holly Vedova said in the statement. Given that vertical mergers will be closely scrutinized as a matter of course, parties need to consider concerns the FTC may identify and prepare strong counters — other than elimination of double marginalization. For example, parties could argue that the transaction expands access to products and expands consumer choice. Parties willing to go the distance with a vertical merger should also remain mindful that the guidelines have never been cited or relied on by a court, and it is the established jurisprudence on vertical transactions that will carry the day.

Rescinding the Consumer Welfare Standard

In July 2021, the FTC rescinded its policy interpreting its statutory mandate to root out "unfair methods of competition" as coterminous with promoting consumer welfare under the Sherman and Clayton Acts. In a July 19, 2021, statement, the FTC called the rescinded policy was "bind[ing] the FTC to liability standards created by generalist judges in private treble-damages actions under the Sherman Act." Still, the consumer welfare standard has been entrenched in antitrust jurisprudence for decades, and the FTC cannot change that. The immediate impact is thus more likely to be seen in administrative actions in the FTC's own court. In a dissenting statement, Republican commissioners countered that FTC leadership does not propose a replacement standard and "that efforts to distance Section 5 from the consumer welfare standard are a recipe for bad policy and adverse court decisions," adding that, "unlike those in academia, the FTC will have to defend its interpretation of Section 5 in court, where it should expect a hostile reception if it cannot offer clear limiting principles."

Labor Market Scrutiny

Government investigations and private litigation relating to no-poach and wage-fixing agreements are ballooning, and criminal indictments are now a reality. Encouraged by President Joe Biden's executive order on competition, the FTC and the DOJ have doubled down on investigating labor markets. Merger investigations now routinely include requests for employee compensation data, inquiries regarding noncompete and nonsolicit agreements, and are more likely to delve into both the merger's effects on labor, and the parties' prior labor practices. The DOJ's challenge to Penguin Random House LLC's proposed acquisition of Simon & Schuster Inc. focuses on harm to the labor market — for authors. In his first public comments, the DOJ's Kanter said: We will fight for American workers including in connection with illegal mergers that substantially lessen competition for laborers. Going forward, you can expect efforts like these not only to continue but to increase. Khan echoed the sentiment, saying: Competition and conduct can hurt us not just as consumers who buy products from a shrinking number of large firms, but also as workers who are especially vulnerable and subject to the whims of a boss we can't equally or practically escape. Antitrust compliance policies now must extend to addressing practices with respect to employee recruiting and compensation. Antitrust compliance training must extend beyond the sales team, and include HR. Businesses are reviewing and revising their compliance policies, and beginning new antitrust training programs to ensure that they are not subjected to claims of depressed wages and barriers to worker mobility.

Looking Ahead to the Year to Come

The year 2021 has been like no other for antitrust enforcement. While the FTC's various policy pronouncements are clearly intended to chill merger activity, it does not appear to have had the intended outcome.

HSR filings continue at off-the-charts levels. Amid this strong showing of M&A activity, the advice is to keep moving transactions forward, stay ahead of the new tacks the agencies might take, and account for newly injected risk and uncertainty.

Looking ahead, expect another energetic year. So far, the FTC's policy changes have not seemed to slow the pace of merger activity, but the frenzy cannot last forever. Nonetheless, merging parties are now going into the merger review process with eyes open, knowing it is likely to be more intense and uncertain. Parties to vertical transactions will no longer ride easy on double marginalization theories, and parties will be handing over their HR and payroll files.

At the same time, the heavy resistance to these changes will continue, if not strengthen, and will play out not just in courts and the halls of Congress, but will also spill into the political mainstream.

The U.S. Chamber of Commerce is planning to spend hundreds of thousands of dollars on an ad campaign across 10 states denouncing what it calls the FTC's overstepping of regulatory authority.

#### Biden’s XO empirically denies any FTC Parker links and more restrictions coming

Bulusu 21 [Siri Bulusu, Reporter Bloomberg Law, 7-12-2021 https://news.bloomberglaw.com/antitrust/worker-license-rules-emerge-as-ftc-competition-oversight-priority]

President Joe Biden’s order, signed Friday, calls on the Federal Trade Commission to boost labor market competition by writing new rules that limit “unnecessary, cumbersome” licensing requirements, often imposed by states’ regulatory boards and quasi-public organizations.

“Some overly restrictive occupational licensing requirements can impede workers’ ability to find jobs and to move between states,” according to the order. The order comes amid a flurry of lawsuits against state or state-backed licensing bodies that accuse them of violating antitrust law by imposing expensive fees or threatening to shut down out-of-state businesses. The text of the order didn’t include specific directions for federal antitrust agencies. But the FTC’s anticipated actions and possible rulemaking could lead to streamlined licensing requirements across states, eliminating demands for worker information unrelated to the job, enforcement of interstate commerce rules, and levying of punitive fines, market watchers say. Licenses are expensive and requirements vary among states, even in the same industry. Reining in the requirements could remove a significant employment barrier, particularly for military families and others who frequently move between states or offer services across state lines. But it also could shift states’ calculations in cracking down on frauds and impostors. Cosmetology licenses can cost up to $15,000 and sometimes years of study, said Dick Carpenter, a senior director of strategic research for the Institute for Justice. Other jobs, ranging from public health and safety positions to interior designers, barbers, and manicurists, also require licensing. “Without any kind of standardization of different licensing requirements—even if you have the same requirements in different jurisdictions—you still have to get a license for each jurisdiction, which impedes an employee’s ability to be mobile,” said Tracey Diamond, a partner at Troutman Pepper LLP’s labor and employment practice.

Potential FTC Moves

The FTC’s options include writing new rules or heightening enforcement of interstate commerce rules in areas where they overlap with antitrust violations, labor market watchers say. Under this principle, restricting labor through onerous licensing requirements would be tantamount to limiting movement of services across borders.

“In the past, occupational licensing was a matter overseen by the Department of Labor, but they don’t quite have the teeth that the Federal Trade Commission has in terms of working in specific locations,” said Morris Kleiner, a University of Minnesota professor of labor policy.

The FTC could turn its limited resources toward scrutinizing occupational licensing programs that narrow the practice scope of a certain profession and limit competition, Kleiner said.

How the commission interprets which licensing requirements are “unnecessary” could be scrutinized. Those could include common requirements such as citizenship and a clean criminal record, said Bobby Chung, a postdoctoral research associate at the University of Illinois at Urbana-Champaign who focuses on licensing. .

“The required training, education and exams should confer the relevant skill sets,” Chung said. “If not, I would regard those requirements as unnecessary.” The agency also may impose specific guidelines that limit fees or frequency of license renewal, Kleiner said. “But more importantly, the FTC’s guidelines could be aimed specifically at states that have ratcheted up their requirements,” he said.

Gaining Attention

Burdensome licensing requirements have increasingly come under federal scrutiny as the labor market has shifted away from manufacturing jobs to service-oriented professions. States began imposing licensing requirements in order to protect consumers from bad actors and standardize services. “Licenses create a monopoly of workers who can provide a service,” Kleiner said. “But if you provide those services without a license, the police powers of the state can arrest and severely fine those individuals.” In 2020, roughly 23% of workers were required to have a license, according to the Bureau of Labor Statistics. Over the years, many states, including Arizona, Connecticut, Nebraska, and Tennessee, have modified their rules to lower what they considered to be burdensome barriers to obtaining licenses. Biden’s move is part of states’ broader push for changes, Carpenter said. “There is a momentum building to raise awareness to the issue.” Advocates for change also cite underemployment and unemployment stemming from the burdensome licensing requirements, as well as allegations that certain industries create occupational licensing to limit competition. Immigrants also can be affected by the licensing requirements, particularly if they hold foreign degrees but are performing lesser-skilled jobs in the U.S., according to a 2017 study by the Migration Policy Institute. Licensing particularly hurts foreign nationals with temporary work visas whose immigration status impedes them from seeking a license to work within their specialty, Chung said. That in turn impedes their path to permanent residency or citizenship, he said.

State Action

The FTC has struggled to rein in licensing practices with antitrust violations partly because public entities, like state-controlled licensing boards, can claim state action immunity. Such immunity authorizes a state to carry out certain legitimate government functions, often in regulated industries that require licensing.

“Many of these state certifications don’t violate antitrust law and that’s because of this doctrine that displaces antitrust law,” said Jesse Markham, a partner at Baker & Miller PLLC’s San Francisco office. “And that’s why these certification requirements exist with impunity.”

In 2015, the Supreme Court ruled in North Carolina State Board of Dental Examiners v. FTC that the state board was operated by market participants. Without active supervision from the state, the board couldn’t claim state action immunity from federal antitrust actions.

The ruling unleashed “dozens of lawsuits"—seeking antitrust treble damages—against individual members of licensing boards, according an October 2020 statement from Reps. Mike Conaway (R-Texas), Jamie Raskin (D-Md.), and David Cicilline (D-R.I.) in support of a bill they introduced to shield board members from such suits.

Qualifying for state action immunity largely depends on whether a board is a true government actor or a private market participant. But this delineation becomes more complex if there’s a blurred line between a state agency handling its own actions or a private group acting under state guidance.

How the FTC handles that blurred line will be one issue the agency tackles as it implements the president’s order.

#### Court rulings on Parker empirically deny disad links

Grossman 15 [Jonathan M. Grossman, co-chair at Cozen O’Connor, Harvard Law School, J.D., 2000, 2-25-2015 https://www.cozen.com/news-resources/publications/2015/supreme-court-delivers-another-blow-to-state-action-antitrust-immunity]

Supreme Court Delivers another Blow to State Action Antitrust Immunity

Today’s Supreme Court decision in North Carolina State Board of Dental Examiners v. Federal Trade Commission1 is the second time in two years that the Court has spoken on the state action exemption to the federal antitrust laws, and the Court once again has made it clear that the days of an expansive interpretation of that exemption are over.

Under the state action exemption, which is based on the principles of state sovereign immunity, restraints imposed by a state as an act of government are exempt from federal antitrust laws. Parker v. Brown, 317 U.S. 341 (1943). Private parties carrying out a state’s regulatory program are also immune as long as the private party: 1) is acting pursuant to a “clearly articulated and affirmatively expressed … state policy;” and 2) is “actively supervised by the state itself.” Cal. Retail Liquor Dealers Ass'n v. Midcal Aluminum, 445 U.S. 97 (1980).

Today’s decision in NC Dental and the 2013 Supreme Court decision in Phoebe Putney2 each focused on one of the two prongs of the Midcal test, and each decision will have the effect of making it more difficult to extend the exemption beyond the state itself.

In NC Dental, the Court focused on the “active supervision” requirement and concluded that the North Carolina Board of Dental Examiners (the Board) did not meet that test. The controversy began in 2003 when non-dentists in North Carolina began to offer teeth-whitening services. The Board, which is designed as a state agency by statute, consisted of six licensed dentists, one licensed dental hygienist, and one consumer member; with the dentists and dental hygienists elected by their peers and the consumer member appointed by the governor of the state. The Board issued nearly 50 cease-and-desist letters to non-dentist providers that effectively resulted in the end of non-dentists providing teeth-whitening services in the state. In 2010, the Federal Trade Commission (FTC) issued an administrative complaint against the Board alleging that it had violated the FTC Act by excluding the non-dentist teeth-whitening providers. The Board argued that it was acting as a state agency and thus immune from federal antitrust laws. The FTC issued a final order against the Board and enjoined it from issuing further extrajudicial orders to teeth-whitening providers in North Carolina. The 4th Circuit denied the Board’s subsequent petition seeking review of the FTC order.3

In affirming the 4th Circuit decision, the Supreme Court held that a state board on which a controlling number of decision makers are active market participants in the occupation the board regulates must satisfy Midcal’s active supervision requirement in order to invoke antitrust immunity under the state action exemption. The Court noted that “when a State empowers a group of active market participants to decide who can participate in its market, and on what terms, the need for supervision is manifest.” Furthermore, while the Board did not argue that it was actively supervised by the state, the Court concluded its decision by reiterating the requirements of active state supervision: (1) the substance of the anti-competitive decision must be reviewed by a state supervisor; (2) the state supervisor must have the power to veto or modify decisions to ensure that they align with state policy; (3) the “mere potential for state supervision” is not a sufficient substitute for an actual decision by the state; and (4) the state supervisor may not be an active market participant.

The 2013 Phoebe Putney decision focused on the “clear articulation” prong of Midcal. That case arose out of a merger of a for-profit hospital with a hospital owned and operated by a county hospital authority (Authority), which was created by the state legislature but operated independently of the state government. The FTC alleged that the transaction was technically structured as an acquisition of the for-profit by the Authority, in a specific attempt to take advantage of the state action exemption. The 11th Circuit observed that Georgia’s Hospital Authorities Law granted hospital authorities the power to “operate projects” including hospitals, to “make and execute contracts and other instruments necessary to exercise the[ir] powers,” and to “acquire by purchase, lease or otherwise … projects.” Based on this broad language, the 11th Circuit found that the legislation clearly indicated that the Georgia Legislature anticipated that the powers it granted to the Authority would produce anti-competitive effects, and thus were a foreseeable result of the legislation and sufficient to meet the Midcal “clear articulation” test. The Supreme Court reversed, holding that the Georgia Legislature did not clearly articulate or affirmatively express a state policy to displace competition in the market for hospital services. The Court noted that the Authority needed to show not just that it had been delegated authority to act, but also that it was authorized to act or regulate in an anti-competitive manner.

The combined effect of NC Dental and Phoebe Putney is that any regulatory body that is not clearly part of the executive branch of a state will have a significantly higher burden to take advantage of the state action exemption. This will require state governments to review and reconsider the structure and procedures of such bodies and should force the bodies themselves to carefully consider whether the state action exemption applies before taking any action that might implicate the federal antitrust laws.

It will also mean that industry participants regulated by such quasi-governmental bodies likely will be emboldened to challenge more adverse actions in court. Given the prevalence of quasi-government entities in states – many of which include market participants – and that they regulate a wide variety of industries including energy, professional services, health care, transportation, and many others, these decisions will likely have significant policy and legal implications for years to come.