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Water, Justice, and Public Health

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Abstract and Keywords

This chapter utilizes theories of social justice and human rights to examine issues of access to clean water and sanitation services, along with competing uses that include agricultural purposes essential for human health. Prospects for a just system of resource access are complicated by several factors. While water is an essential public health resource, competing uses and social values must be balanced. Because groundwater and surface water availability depends on how each is used, integrated water management approaches are necessary, and their comprehensive authority results in decisions that touch on every aspect of social life. Moreover, physical water scarcity, once limited to arid and desert regions, now affects the majority of the world's population, especially the global poor and megacities. Finally, as water assumes greater importance as a global commodity, existing models of property rights are open to fresh moral scrutiny, ideals of democratic control over vital resources are challenged, and effective national sovereignty is tested by the complex realities of transboundary waters.

Keywords: social justice, human rights, water scarcity, global commodity, integrated water management, public health ethics, public health

Introduction

Secure access to clean water is central within many discussions of public health ethics. The task of this chapter is threefold. The first section, "Water and Theoretical Approaches to Public Health Ethics," surveys two complementary philosophical frameworks that address water resource management issues and their relation to public health. Theories of social justice and human rights that provide the normative focus of this chapter share a commitment to health as a core element of human well-being, which is foundational to the requirements of justice.

The second section, “Scarcity and the Problem of Common-Pool Resources,” describes the health implications of how access to water and sanitation services are managed along with competing demands. The discussion highlights the extent to which principles of hydrology, together with demographic trends and land use patterns, make the task of integrated water resource management a particular kind of moral problem. In most circumstances, secure access to clean water and sanitation requires some entity to manage a common-pool resource, which requires choices among competing uses over an increasingly wide geographic region. The upshot is that the highly consequential choices of water managers become more complicated and ethically contested as competition for progressively scarce resources intensifies.

The third section, “Global Commodification, Governance, and Control over Resources,” addresses ethical issues posed by the global commodification of water; in particular, it looks at the mechanisms and emerging patterns of control and institutions of governance. Globalization introduces new controversies about the kinds of institutional arrangements best suited for ensuring distributive fairness and promoting water security for all current users, including the global poor, and for future generations.

Water and Theoretical Approaches to Public Health Ethics

Secure access to clean water and water for other purposes is an important concern within contemporary theories of social justice. Such theories assume that a just society is one that provides favorable social conditions and sufficient resources for the secure realization of the most important elements of well-being for its members. This approach involves a two-step argument.

The first task is the identification of the core elements of well-being that anyone should want, whatever else they would want as part of a decent or dignified human life (Nussbaum, 2000; Powers and Faden, 2006). Social justice accordingly involves the arrangement of a society’s major institutions and social practices in order to secure sufficient levels of well-being across each of the core elements for each member of that society. Health, including the preservation of life and the reduction of premature morbidity, is widely recognized as a core element of human well-being that just social institutions have the responsibility to protect and promote (Powers and Faden, 2006; Griffin, 2008; Ruger, 2010; Venkatapuram, 2011; Liao, 2015).

The second step places the practical focus on identifying the *necessary social conditions* and the *essential resources* that are required for realizing the basic core elements for well-being for all members of a society. Chief among the necessary social conditions are institutional arrangements that effectively combat structurally entrenched forms of disadvantage, including unfair mechanisms of political control that benefit some segments of society at the expense of others. The moral objection is that these arrangements systematically disfavor vulnerable social groups and the occupants of

marginalized and disempowered social positions, and thus undermine their prospects for realizing sufficient levels of health and other core elements of well-being.

Resources are deemed “essential if they are indispensable for survival” (Pistor and De Shutter, 2016). While the precise list of resources of such strategic moral importance is subject to disagreement at the margins, most theories agree that water, food, and shelter are essential resources that trigger a heightened degree of moral concern because of their indispensable role in preserving life and protecting health quality (Daniels, 2008; Rawls, 2001). Theories of social justice therefore emphasize the importance of a social guarantee for the provision of clean water and sanitation services, along with water for food and the preservation of the ecological prerequisites for sustainable access to such services across generations (Powers and Faden, 2006; Venkatapuram, 2011).

Philosophical discussions of human rights also emphasize the special strategic importance of water resources for human well-being, in particular for health. The task of specifying human rights claims involves a two-stage argument that is similar in format to theories of social justice. Interest-based theories of human rights begin with a conception of the core elements of the right holder’s well-being, which are of overriding importance to every human being (Raz, 1986; Tasioulas, 2015). Typically, human rights are described as the minimum demands of justice. They are the most basic claims or entitlements that all individuals have against the major institutions of any organized society (Shue, 1996; Nickel, 2007).

The second step of the argument is the identification of the “object” of human rights—what the right is a *claim to*—by reference to the various resources and social conditions that are indispensable to the fulfillment of those rights (Raz, 2015; Liao and Etinson, 2012). Thus, a human right grounded in a universal moral interest in health consists of claims to specific objects, such as access to basic health care and primary public health services, along with a public guarantee of the social infrastructure necessary for the provision of clean water and sanitation services for direct personal use and water suitable to the production of food (Nickel, 2007; Risse, 2014).

Human rights theory has been especially prominent in international conversations regarding water policy ever since clean drinking water and sanitation were declared to be a human right in the Dublin Statement on Water and Sustainable Development in 1992 (World Meteorological Organization, 1992). In 2010 the United Nations (UN) declared “the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights” (UNGA, 2010).

Social structural theories of justice have been particularly influential in some domestic contexts, and they complement human rights approaches. Both approaches emphasize the indispensability of effective public institutions that have the requisite organizational capacity and adhere to principles of fair access to sufficient clean water and sanitation services and other vital uses for everyone, now and for future generations.

The public health rationale for social guarantees of clean water and sanitation as a requirement of justice is well known (Barlow, 2013). Approximately 3.4 million people die annually from water-related diseases (WHO, 2001). Of those who die each year from lack of access to safe drinking water and adequate sanitation, 1.4 million are children (UNICEF, 2004). More than 2.4 billion people lack improved sanitation (WHO/UNICEF JMP, 2015). For at least 1.8 billion people, the primary source of drinking water is contaminated by human waste (Bain et al., 2014). The global burden of waterborne disease is unevenly distributed. Approximately 97 percent of deaths related to inadequate water sanitation occur in developing countries where the public health infrastructure is weak (CDC, 2016).

Access to water for drinking, cooking, and personal hygiene is thus a big part of the health-related rationale for both human rights and principles of social justice. Water is an important resource for sanitation in securing health and overall well-being. The absence of adequate sanitation facilities and infrastructure results in a heavy burden of disease (e.g., stunting, intestinal helminths, diarrhea) and has an established impact on privacy, dignity, and physical safety for girls and women (WHO/UNICEF JMP, 2015).

While much of the human rights literature focuses on clean water for drinking and sanitation, water also matters from a public health perspective because it is needed for food production that sustains life and ensures proper nutrition (UN CESCR, 2002). Agriculture looms large in this discussion because it accounts for approximately 70 percent of all freshwater withdrawals worldwide, and among the developed nations it is the largest source of water pollution (World Bank, 2007).

Scarcity and the Problem of Common-Pool Resources

Indispensability for health, scarcity, and barriers to access give water its acute moral salience. In simple economic terms, scarcity is defined as the condition in which demand for water—from all sectors, including individuals, agriculture, and manufacturing—exceeds the available supply. In addition, a problem that has come into sharper focus over the last few decades is physical scarcity occurring in places other than arid and desert regions. Physical scarcity is the condition in which there is simply not enough water available to meet the needs of the inhabitants of a region. However, in less developed countries and poor regions of developed countries, poverty and inadequate institutional capital investment remain among the most important factors in the lack of water resources sufficient to meet demand. A UN Development Programme report concluded that “[t]he scarcity at the heart of the global water crisis is rooted in power, poverty and inequality and not in physical availability” (UNDP, 2006).

Physical scarcity nonetheless complicates matters, especially in regions where infrastructure is inadequate and poverty impedes access for many people. At a landmark United Nations conference at Mar del Plata, Argentina, in 1977, the focus was upon the

previously counterintuitive notion that water is becoming physically scarce in many regions of the world as a result of disruptions of the hydrologic cycle, in part because of changes in the built environment. Water scarcity came to be recognized as a common-pool resource problem.

A common-pool resource is one in which availability in sufficient quantity and quality to meet the demands of each person and for a multiplicity of purposes depends on the activities of all who draw upon that resource. In response to an understanding of regional water availability as a joint function of growing physical scarcity, poverty and other durable impediments to access, and the necessity of allocating among competing uses, conference participants endorsed the idea of integrated water resources management (IWRM).

The scope of the management task, properly done, is breathtaking. A managing entity has to preside over water storage, treatment, and recycling. It has to regulate a variety of types of agricultural and industrial activities, and balance competing uses. It has to exercise some control over suburban sprawl, industrial siting, and land use matters that implicate traditional ideas of private land rights. It has to adjudicate between the interests of those living upstream and those living downstream in a river basin, and ensure that the water in aquifers and rivers is not too polluted for use for water supply, industrial production, agricultural use, or for the protection of biodiversity, wetlands, and aquatic systems in rivers (Falkenmark, 2001).

The enormous ethical implications of IWRM soon became clear. There was a dawning recognition of the potential for proper water management to touch upon nearly every aspect of individual decision-making and collective social organization. Indeed, the most widely cited definitions of IWRM encompass many of the normative dimensions at stake. The Global Water Partnership definition is as follows: “IWRM is a process which promotes the coordinated development of water, land, and related resources, in order to maximize the resultant economic social and welfare in an equitable manner without compromising the sustainability of vital ecosystems” (GWP, 2000).

The GWP summarizes the ethical significance of this definition by noting three distinct, frequently competing goals. The goal of economic efficiency is rooted in the value of economic growth and development, the goal of equity is a matter of adjudicating fairly between the competing claims of current users, and the goal of sustainability refers to the underlying health of ecosystems that assures availability of adequate resources to future generations.

A major impetus for IWRM was a fundamental change in the scientific consensus among hydrologists. The long-standing assumption of stationarity—the idea that interannual hydrologic variability fluctuates within an overall envelope of stability—was abandoned (Postel, Daily, and Ehrlich, 1996). It gradually became clear from longitudinal data sets that historical patterns of physical availability throughout the world were changing,

sometimes rapidly, and that the amount of physically available freshwater was in widespread decline (Milly et al., 2008).

The causes of decline in available freshwater are complex and interactive (Vörösmarty et al., 2010). The initial models focused on the immediate consequences of the built environment, such as cities, large dams and other alterations of rivers, and cleared forests. The construction of cities and extended areas of hardscape (concrete and asphalt), along with the destruction of watersheds, wetlands, and forests, leads to more runoff into oceans. Consequently, there is less absorption into surface waters and aquifers. Surface water levels and aquifer reserves also exert interactive influence, with declining aquifers reducing the replacement rates of surface waters and the decreased capture of rainwater in bodies of surface water then resulting in slower recharge rates for aquifers (Glennon, 2009).

Demographic changes are another factor. Population growth and the concentration of populations in urban areas result in an accelerated rate of withdrawal of water from all sources. These include rainwater, surface water sources such as lakes and rivers, and groundwater stored in aquifers below the surface. The high-demand problem is not confined to the populous urban areas of the developed world. High-demand water users are becoming more geographically concentrated in regions that cannot sustain demand levels because of a combination of physical scarcity and insufficient financial resources to provide water and sanitation services to the population, especially in megacities (McDonald et al., 2014).

In addition, not all types of water are equally renewable, and not all uses of water have the same effects on watersheds. Water used for industrial purposes and large-scale agriculture can be so heavily polluted that it becomes unsuitable for drinking or bathing, and some types of pollution are less amenable to conventional treatment processes (Hoffman, 2009).

The combined problems stemming from economic scarcity and physical scarcity are now widely seen as global issues, and although heavily concentrated in India and China, no region of the world is unaffected. Current estimates are that by 2025, 1.8 billion people will experience absolute water scarcity and as much as two-thirds of the world will experience water stress (UN-Water, 2017).

Absolute water scarcity is defined as a condition in which individuals have insufficient access to safe and affordable water to satisfy their needs for drinking, washing, or their livelihoods for a significant period of time. *Water stress* is defined as a condition of intermittent insufficiency. However, estimates of the shortfall in water availability are bound up with a number of empirical and normative assumptions, and these assumptions reflect the interdependence between economic and physical scarcity. Whether an area qualifies as “water scarce” depends on how people’s needs are defined and whether per capita use will increase, as it has in developed and developing countries. It also depends on whether the requirements for preservation of water ecosystems are taken into account and whether the long-term trend of increasingly water-intensive agricultural and

industrial processes will continue, as well as whether and what kind of pricing mechanisms will be adopted in order to restrain overuse (Rijsberman, 1994). All of these judgments are normatively laden social choices. They extend far beyond any technocratic vision of sound fiscal management.

Perhaps unsurprisingly, there is considerable overlap between areas now most affected by economic scarcity and many of the regions at greatest risk for worsening physical scarcity. Cited below are some of the key facts that illuminate the unequal global burden of water scarcity.

Accessible surface water is diminishing. Over 1.4 billion people currently live in river basins where the use of water exceeds minimum replacement levels, leading to the dewatering of rivers (World Bank, 2005). Widely cited estimates show an expected increase of people living in river basins under severe surface water stress from 1.6 billion in 2000 to 3.9 billion by 2050. That is roughly 40 percent of the anticipated world population of 9.7 billion people (OECD, 2012). New research shows that areas affected disproportionately are large population centers of the developing world, with more than 40 percent of some of the world's great cities supplied by surface water expected to be vulnerable to severe shortages and drought by 2040 (Padowski and Gorelick, 2014).

Up to 2 billion people who depend on winter snow to deliver their summer water could see shortages by 2060 as upland and mountain snowpack continue to dwindle (Mankin et al., 2015). Among the worst affected are the predominantly poor inhabitants of the Tien Shan located in China, Kazakhstan, Kyrgyzstan, and Uzbekistan. About half of the mountain's glacier volume in that region could be depleted by the 2050s (Farinotti et al., 2015).

More than half of the world's population is experiencing groundwater depletion below recharge rates, mostly due to industrial agriculture, overgrazing, and deforestation. Aquifer withdrawals are predicted to increase by 50 percent by 2025 in developing countries, and 18 percent in developed countries (UNEP, 2007). This trend is significant because aquifers account for 35 percent of human water use worldwide. Recent satellite studies confirm that nearly a third of the world's thirty-seven largest aquifers are being drained more quickly than they are being replenished, and the main impact is in the poor, densely populated regions of northwestern India, Pakistan, and northern Africa (Richey et al., 2015).

Climate change makes these challenges worse. Among the main areas to face greater losses of accessible water are the equatorial regions, which are already among the most water-stressed areas. These areas also tend to be the parts of the world most dependent on rainfall rather than irrigation as the basis for agriculture. Rain-dependent agricultural areas that are at much greater risk of crop failure are the hottest, driest regions of the world.

The disruption of the hydrological cycle due to global warming is likely to hit these regions first and worst (Powers, 2014). The Intergovernmental Panel on Climate Change (IPCC, 2014) predicts yields from rain-dependent agriculture could be down by 50 percent as soon as 2020. Many of the world's poorest are concentrated in Southeast Asia, where some of the world's largest rivers no longer flow to the sea due to glacier decline, which is also attributed in large part to global warming.

The upshot is that the reduced availability of water will not be distributed equally across the globe. Given these geographic patterns of water scarcity, it is no wonder that water resource management discussions at the international level no longer focus solely on the localized challenges addressed by IWRM. Matters of regional water security are bound up with geopolitical issues of national and international security. According to one estimate, there are 276 transnational river basins, and the risk of conflict is significant (Chellamy, 2013).

For example, China has embarked upon a series of roughly 130 dam and water diversion projects. They will alter the course and flow of rivers that pass through ten other countries, affecting 2 billion people. Because China controls the entire Tibetan plateau, where these rivers originate in its vast glaciers, it alone has the power to control the primary water supply for all of Southeast Asia (Christopher, 2013). Some legal and political theorists propose to manage such conflicts by a principle of hydrosolidarity, an aspirational ideal encouraging collaboration among all affected parties in order to achieve fairness between upstream and downstream users and preserve a common asset (Wouters, Vinogradov, and Magsig, 2008). In some contexts, mutual recognition of common interests has resulted in voluntary agreements among riparian users without legal, institutional sanctions and enforcement mechanisms (Ostrom, 1990). However, as the Tibetan plateau situation illustrates, the extent of potential water-based cross-border conflict remains an open question.

Global Commodification, Governance, and Control over Resources

The global poor face new threats to water security, even within regions of the world where physical water scarcity is not severe. The reason is that water is now a valuable global commodity, attracting foreign investment in water-rich, cash-poor nations and potentially making economic access to water for the poor more difficult. Here again, the root of the problem lies in "power, poverty and inequality." Three types of water-intensive foreign investment, domestic forays into global commodity markets, and other interventions in domestic resource policy have provoked the most ethical controversy.

First, multinational corporations have off-shored many of the most water-intensive and most water-contaminating manufacturing activities (Richter et al., 2013). The off-shoring occurs on both the front end of the production process and, again, on the back end with the disposal of toxic wastes at the end of the life cycle of consumer and industrial

products (Pellow, 2007; Keyi, 2014). In many developing countries, off-shoring at both ends of the lifecycle of consumer goods is facilitated by the fact that environmental regulation is lax. The result is that the social costs of water pollution is "externalized"—imposed on society at large or on nearby landowners and individuals who suffer the adverse health effects of pollution, far away from most of the affluent consumers, who enjoy the benefits of these products without bearing the environmental health burdens of their production (Kuehr, 2016). Many human rights and nongovernmental organizations are particularly critical of the World Bank's role in encouraging the trend toward massive deregulation that exacerbates the risk of severe environmental health externalities, especially in countries run by autocrats, where economic development is prioritized over the protection of health and the environment (GRAIN, 2013).

In addition, most developing countries impose few restrictions on the quantity of water used. For example, both domestic and foreign-based soda and bottled water companies are allowed to extract massive quantities of water for virtually no cost beyond the purchase price of the adjacent land. The problem is that water ownership rights throughout much of the world are established according to the "law of capture" or "rule of prior appropriation." Legal rights to water from rivers and lakes is granted to whomever is first to divert it for their own use, as long as they put it to some beneficial use, no matter how much they extract (FAO, 2006).

Second, multinational agribusiness conglomerates are locating water-intensive agricultural facilities in developing countries. Land with an adequate supply of water is an asset of crucial importance for agriculture, especially for water-intensive, large-scale industrial agricultural enterprises (Klare, 2012). Critics have dubbed it the "land and water grab" (Kugelman and Levenstein, 2013). Although it is too early to assess its ultimate scale and impact, massive foreign investment in large tracts of land has occurred in many water-rich, economically desperate countries, where land is extraordinarily cheap by developed world standards (World Bank, 2010).

Often, agricultural land is purchased or leased under long-term contracts that provide little or no compensation to the host nation, other than the vague, unenforceable promise to stimulate economic development (GRAIN, 2013; CHRGJ, 2010). Foreign investment in agricultural land is further incentivized by lax environmental regulation and the lack of adequate legal titling of traditional lands sufficient to protect the holders of traditional land and water claims (Knight et al., 2012). Knowledgeable critics point to the consequences of purchases or leases of land. Water is diverted from use for local agriculture and the satisfaction of basic human needs, only to be abandoned once the nutrients have been depleted and nearby rivers polluted from chemical fertilizer run-off (De Shutter, 2011; Schiffman, 2013; Robertson and Pinstrup-Anderson, 2010; HRW, 2012). The upshot is that the benefits of large-scale global land and water acquisition go primarily to the global affluent, while the environmental health consequences of degraded water quality are shifted to the poorest, most vulnerable regions of the world in exchange for dubious economic benefits (Dean, Lovely, and Wan, 2009).

Third, foreign investors and transnational water management corporations have taken over the operation of municipal water and sanitation services, and, in some cases, taken control over all water resources within large river basin areas. The initial rationale for privatization focused on the special expertise of private management corporations and the prospect of obtaining greater efficiencies than publicly controlled facilities achieve. The aim was to replace state-subsidized services with more cost-sensitive pricing mechanisms (Scheierling, 2016). The effects have been debated by way of competing case studies, with cases being cited where access by the poor has expanded and cases where access has been lost (Barlow, 2007; Segerfeldt, 2005). However, even the World Bank's own internal analysis concluded that "there is no statistically significant difference between the efficiency performance of public and private operators in this sector" (Estache, Perelman, and Trujillo, 2005).

Privatization arrangements initially arose as a byproduct of World Bank lending policies that made them a condition of loans, but now they have the backing of an array of international organizations based in the developed nations that are home to the multinational investors. As the privatization movement retains its allure among global economic elites, it increasingly relies on a new rationale. The argument is that many national governments have too much sovereign debt and not enough tax revenue to fund the necessary infrastructure improvements. They point to infrastructure that is needed to fulfill the sixth of seventeen Sustainable Development Goal (SDGs), which establishes ambitious targets for ensuring universal and equitable access to water and sanitation services, greater water efficiency, and the protection and restoration of water-related ecosystems (UN, 2017). Cost estimates for achieving these targets range between $74 billion to $116 billion annually (World Bank, 2016). The UN Conference on Trade and Development estimates the seventeen SDGs overall will require between $3.3 trillion and $4.5 trillion a year to implement (UNCTAD, 2014). Many countries lack the resources.

Moreover, the new privatization argument is bolstered by the prediction that the investment shortfall is unlikely to be made up from donations from developed nations. A recent report survey shows that aid donors pledged to spend $54 billion in aid for water and sanitation between 2002 and 2010 but only released $37 billion (WaterAid and Development Initiatives, 2012). Even the full $54 billion donated over nine years is but a drop in the bucket. A recent OECD (2015) analysis confirms what developing nations already know about pledges of foreign assistance of any sort: massive shortfalls between promised aid and received donations are the norm.

The conclusion of this new argument for privatization is that there is simply no alternative, and that the best option involves public-private partnerships (PPPs), widely encouraged by the World Bank and various nongovernmental organizations (NGOs) representing the interests of developed nations. PPPs get their capital from global hedge fund and pension fund investors. The investors create profit-driven private corporations that acquire public utilities, like water, and they fill the governing boards with representatives of these funds (*Bretton Woods Observer*, 2015). Instead of promising

management expertise that will yield greater efficiencies, the new rationale offers the prospect of much-needed capital for infrastructure.

The problem with the “no-alternative” argument is that it ignores two issues of structural injustice that contributed to the infrastructural shortfall. The first problem is the morally tainted origin of the sovereign debt. Decades of international lending practices by the IMF and World Bank imposed onerous austerity conditions that deprived debtor states of their capacity to undertake public welfare programs, leaving them with a choice between privatization of essential services or their elimination (Stiglitz, 2007). The second problem is tax competition, the process by which countries compete for foreign registration of corporate headquarters, luring them with tax breaks and subsidies. In response to competitive pressures, nations cut corporate taxes dramatically, inaugurating a race to the bottom, depriving themselves and other countries of the revenues necessary to fund essential services (Dietsch, 2015).

Critics also argue that PPPs and the water privatization approach generally raise serious ethical questions about the kinds of decisions that should be subject to collective democratic decision-making (Bachvarova, 2013). The problem is that the governing body has a strict fiduciary duty to shareholders, and often a very attenuated accountability to ratepayers, because they insist on management contracts that give them wide policy discretion, without the usual mechanisms of review of public utility oversight boards (Romero, 2015; Alexander, 2014). The point of such criticisms is that there is far more at stake than efficient management. When multinational corporations assume authority over vital resources, they pre-empt the moral judgments of those communities affected by such policies on decisions about fees, subsidies for the poor, and long-term investment for the sake of future generations (Kishimoto, Lobina, and Petitjean, 2015). More generally, critics object that PPPs are emblematic of a larger and more insidious global trend toward de-democratization of the public sphere, where the interests of hypermobile capital bypass democratically accountable collective decision-making (Brown, 2015).

Conclusion

Threats to water security, and ultimately to public health, take various forms. Traditional challenges posed by poverty and economic scarcity are conjoined with physical scarcity. The need for management of whole river basins highlights the competing social values and ethical decisions that transcend concerns about efficient management. Even the task of democratic decision-making regarding collective goals is being put to the test. Transboundary rivers pose problems that go beyond the scope of authority of any political jurisdiction, and the transformation of water into a global commodity puts global capital in competition with sovereign nations to determine the future of water resources. Threats to water security in every instance are rooted in “power, poverty and inequality.”

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