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ES/ANTH196

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Final Exam

Q1.

In all corners of the world with a history of human civilization, local plants and fungi have been identified for their psychoactive properties and consumed for cultural and occasionally recreational practices. It is difficult to pinpoint the most important psychoactive plants and fungi used by traditional cultures around the world because there is a magnitude of them and some are recognized by indigenous cultures which have not been recognized for psychoactive properties in western society. However, there are frequently used plants across cultures which have been documented and studied for their chemical properties and traditional cultural uses. Some of these plants include the Peyote cactus *(Lophophora williamsii)* commonly used by the indigenous tribes of Mexico and the Southwestern United States, the San Pedro cactus *(Echinopsis pachanoi)* used by tribes across South America, Magic Mushrooms *(Psilocybe cubensis)* used by tribes across Central America, Cannabis *(Cannabis sativa)* used by traditional cultures globally, Salvia *(Salvia officinalis)* used by the Sierra Mazateca in Mexico, Khat *(Catha edulis)* used by indigenous tribes of East Africa and the Middle East, Ayahuasca *(Banisteriopsis caapi)* used by tribes belonging to the Upper Amazon, and Coca *(Erythroxylum coca)* used by tribes originating from South America, Indonesia, and the West Indies.

There are common themes in the uses of different psychoactive plants across cultures globally. The use of most psychoactive plants across cultures globally is purely for their

medicinal purposes and are seldom taken recreationally. The consumption and preparation of these plants and fungi vary throughout the different cultures that use them, however there is a common occurrence in manner which they are consumed. All documented use of Peyote, San Pedro, Magic Mushrooms, and Ayahuasca in a traditional context has shown that these substances are consumed either as a group or led by a shaman or medicine person, the individual does not administer the medicine to themselves without proper guidance[1]. These plants are also commonly used identify illnesses or their places of origin to further treat the individual. These identifications are either done with just the guiding medicine person or as a group in a spiritual ceremony in which the other participants ingest the substance as well and aid the ill individual on their journey to discovery.

Another similarity among cultures across the globe in their consumption of different psychoactive plants and fungi is seen through divine themes in origin of the plant and how it is used to communicate with divine spirits. This is not common to psychoactive plants as different plants are associated with different gods and possess cultural significance, but the divine gods associated with these magical plants are usually powerful and aligned with esteemed powers related to overall well-being and health. The magical plants are consumed by medicinal leaders

[1] Calabrese, Joseph D. *A Different Medicine Postcolonial Healing in the Native American Church*. Oxford University Press, 2013.
Glass-Coffin, Bonnie. "Shamanism and San Pedro through Time: Some Notes on the Archaeology, History, and Continued Use of an Entheogen in Northern Peru." *Anthropology of Consciousness*, vol. 21, no. 1, Mar. 2010, pp. 58–82.,
Fotiou, Evgenia. "Technologies of the Body in Contemporary Ayahuasca Shamanism in the Peruvian Amazon: Implications for Future Research." *Human Ecology*, vol. 47, no. 1, May 2019, pp. 145–151.
Carod-Artal, F.j. "Hallucinogenic Drugs in Pre-Columbian Mesoamerican Cultures." *Neurología (English Edition)*, vol. 30, no. 1, 5 July 2015, pp. 42–49., doi:10.1016/j.nrleng.2011.07.010.

in the community (and sometimes general members of the tribe) to communicate with these praised creators[2].

Western colonization has banned the use and cultivation of many psychoactive plants throughout history. Subsequently, the non-indigenous encounters with these substances have been documented and spread to the western public. Now, there is a widespread use of these plants for recreational rather than spiritual and medicinal uses. There are existing folk communities that continue to practice traditional ceremonies and healing practices using psychoactive plants despite their illegal status and now-stigmatized nature in contemporary society. While the introduction of the identification and use of psychoactive plants prompted a psychedelic revolution throughout the western world, it has also served to document traditional uses of the plants and researches have been able to identify potential healing properties that can be used to treat debilitating ailments such as depression, PTSD, and alzheimers.

Q5.

Modern ethnobotanical research relies on the use of quantitative research methods for inter and cross-cultural analysis of ethnobotanical knowledge (EBK). The employment of quantitative methods has allowed ethnobotanists to track the use-value of different plants along with how culturally significant they are. Prior to quantitative research methods in identifying and understanding the use of plants in indigenous communities, little was known about the extent of EBK of these communities and how their uses aligned with those of other communities. There are many tools that are used in quantitative research that allows researchers to gain a greater

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[2] Luna, Eduardo Luis. "Ayahuasca: Shaminism Shared Across Cultures" *Cultural Survival,* June 2003.
Schultes, Richard E. *Ethnobotany: Evolution of a Discipline*. Dioscorides Press, 1995.

cultural perspective of plant knowledge by requiring a relationship with community members to record their knowledge. In using quantitative data collection methods, ethnobotanists are placing special emphasis on the collection of sample data across different communities and different members of the same community to conduct cross-reference analysis and determine how different people use their local flora, their relationship with it, and their extent of knowledge about its identification and use-value. By using quantitative research methods, the EBK of different people and groups are able to be documented and analyzed to see how it has changed overtime and what that might mean for conservation efforts.

Quantitative research methods have allowed ethnobotanists to perform analyses of plant use in terms of variation of uses across species, across cultures, and across habitats. To acquire the data necessary to make these comparisons and draw conclusions, a variety of different methods are employed to yield large numbers of data. The uses totaled method consists of simply recording the number of uses for a specific plant and categorizing them accordingly[3]. This method is sufficient for creating an inventory of plants used within a culture but does not account for the plant's level of cultural importance. The method of subjective allocation takes into account the cultural importance of plants used within a specific community more so than the uses totaled method as the researcher appoints their opinion of the level of significance of the plant to the community based on amount and reason for use. The final quantitative method employed in modern ethnobotany is the gathering of information on the use-value of plants from a variety of informants within the community and the cultural importance of each reported plant is assumed by the researcher based on the number of informance who individually report a given use. All of

[3] Zent, Stanford. *Quantitative Ethnobotany.* 2019. Powerpoint Presentation.

these methods are used in quantitative research to evaluate and compare the ethnobotanical knowledge amongst different communities and even amongst different standings within the same community.

The study published by O. Phillips et al. entitled, "Quantitative Ethnobotany and Amazonian Conservation" provides a great example of a quantitative ethnobotanical study. In this investigation, quantitative data was used to compare the usefulness of different forest types to indigenous communities and determine what those use values mean for the conservation of the Amazon forest and its people. The researchers worked in an area consisting of six different forest types across the Andes and interviewed 29 local informants about their knowledge of around 570 woody species excluding shrubs, herbs, epiphytes, and vines. By working in different areas and with different groups of people, the data collected from the informants from different geological areas was then analyzed and plant-specific use value was calculated to see comparisons in plant use amongst different forest types. These comparisons then allowed the research team to conclude the valued use of some forest types over others[4]. By using quantitative data collection methods, the team was able to compare use values and cultural significance as outlined by the informants and provide insight that will aid future ethnobotanists in working with different *mestizo* groups for conservation efforts.

Q6.

The term cultural or anthropogenic forests has been coined to describe areas of the diverse Amazonian forests that have been inhabited, used, and changed by the people native to

[4] Phillips, O., et al. "Quantitative Ethnobotany and Amazonian Conservation." *Conservation Biology*, vol. 8, no. 1, 1994, pp. 225–248.

the dense forests for millenia. Since Pre-Columbian times, groups across the Amazon have used, managed, produced, eliminated, and domesticated plants from their natural environment[5]. The relationship with the natural environment that these groups, presently and throughout history, have formed has completely transformed the Amazonian forest and its ecological makeup to what we observe today. Because of this deep cultural relationship with their natural environment, some forests in the Amazon have been recognized as cultural forests — environments that are not pristinely natural but have been built and exist with credit to hundreds of years of evolving human manipulation and management.

To understand what is meant by the term cultural forests, the history of indigenous presence and cultivation of the Amazonia must be discussed. Prior to the perspective of recognizing cultural forests, it was held that indigenous peoples of the Amazon simply adapted their cultures to sustain themselves amidst changing conditions of their natural environment. By recognizing cultural forests, this narrative changes to tell the story of indigenous contribution to the changing environmental conditions. Rather than explaining cultural change and evolution through use of available resources, the perspective of cultural forests suggests that the Amazonians manage and manipulate their critical resources and changes in use/cultivation of local plants reflects an adaptation of previous culture rather than strictly use of resources because of availability[6]. The recognition of anthropogenic forests gives credit to the indigenous cultures which have made the Amazonia the incredibly diverse landscape this is inhabited and used for its resources, today. Empirical evidence for indigenous people diversifying the Amazon can be

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[5]Balee, William. *Cultural Forests of the Amazon: A Historical Ecology of People and Their Landscapes.* University of Alabama Press, 2013.

[6] Balee, William. "The Culture of Amazonian Forests." *Resource Management in Amazonia: Indigenous and Folk Strategies* , 1989, pp. 1–21.

found through disturbance indicators at Pre-Columbian archaeological sites and how those disturbance indicators relate to indigenous natural practices today. Manipulation of land levels shows history of a solution for poor drainage to increase the yield of production. Where human disturbance is noted in historic sites, ecologists observe specific types of palm that do not grow elsewhere in the dry terrains of the Amazon naturally which were used in production. This manipulation of the land to yield specific results/crops demonstrates the deep relationship between Amazonian people and their environment. But this historical evidence of natural manipulation also suggests that culture is not dependent on the environment; they have a relationship but exist separately.

The recognition of cultural forests has completely transformed how ethnobotanists, anthropologists, and ecologists have thought about Amazonian ecosystems and their inhabitants. With regard to conservation, the management and conservation efforts of indigenous tribes has been analyzed for effective sustainability of the environment along with cultural characteristics. A common management strategy that has been used for hundreds of years for yielding specific plants with resourceful value is burning forest plots to allow new, bountiful growth. While this is effective for producing specific botanical harvests, ecologists have recognized that this practice further diversifies the forest and plots burned may never fully return to their original, pristine condition[7]. This indigenous management strategy only furthers the perspective that the current Amazon is the product of hundreds of years of indigenous manipulation and use and must be recognized with respect to the people who have constructed it.

[7] Balee, William. "The Culture of Amazonian Forests." *Resource Management in Amazonia: Indigenous and Folk Strategies* , 1989, pp. 1–21.

Q7.

Markets serve as a great insight into what items are important to certain cultures. The commodification of products their cultural use-value as items in the market are assumed to be used frequently enough to warrant cultivation and distribution. By taking an inventory and analyzing the products sold in markets of indigenous communities, ethnobotanists are able to learn which plants are commonly used and further investigate their use-value and role in indigenous culture.

Markets can tell ethnobotanists ample things about a culture's relationship with the natural world, their economic system, and systems of production and distribution. The central place theory has been widely employed to identify different types of market places and aid researchers in determining what type of survey will yield the most relevant information about the market and people participating it[8]. The types of markets in indigenous communities is broken down into a hierarchical structure spanning from regional markets in which several marketplaces are supported to minor markets which consist of strictly local production and exchange of goods. It is essential that ethnobotanists know what type of market(s) they will be observing in order to understand the flow of commerce and what products are of particular importance. In conducting surveys of markets, there are some general methods that are typically followed regardless of market type. The ethnobotanist should first observe the market and familiarize themselves with its flow— how products are purchased, what kinds of products are available, how many sellers are present, the times of operation, location, etc. The ethnobotanist should then create an

[8] Cunningham, A. B. *Applied Ethnobotany: People, Wild Plant Use and Conservation*. Routledge, 2016.

inventory of the available products and take note of their quantity, price, and frequency of purchase[9]. From this inventory the researcher will be able to identify commodities of particular importance not only to the economy of a community but also their cultural makeup. The types of products and frequency of production can tell an ethnobotanist about the process of cultivation, seasonality, and use of certain plants along with the economic structure of a group and their consequent relationship with other communities and their commercial products.

As previously mentioned, understanding the function and locality of a market is essential for ethnobotanists to conduct surveys of said markets. Depending on what type of market it is, the traffic to it will be varied and from different outlets (via rivers, roads, within the community, etc.). Surveys of indigenous markets will vary based on their locality and size, but generally after the market has been observed by the ethnobotanist, they will design surveys that aim to uncover which plants are of high demand and exceed their capacity to regenerate after harvest. These plants tell the surveyor which indigenous species have been, or are close to being, domesticated and harvested for commercial value[10]. Besides what goods are being produced and sold, ethnobotanists also research who is selling items, how much they're selling it for, where it was cultivated, and their profit. Ethnobotanists should take inventory of what individual sellers are offering and also speak to the sellers to gain knowledge of the process from cultivation to final sale[11]. From speaking with sellers and observing the general flow of the market, ethnobotanists can then identify major harvest areas and the processes in which communities cultivate land.

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[9] Cunningham, A. B. *Applied Ethnobotany: People, Wild Plant Use and Conservation*. Routledge, 2016.
[10] Balick, Michael J. "Transforming Ethnobotany for the New Millennium." *Annals of the Missouri Botanical Garden*, vol. 83, no. 1, 1996, pp. 58–66.
[11] Cunningham, A. B. *Applied Ethnobotany: People, Wild Plant Use and Conservation*. Routledge, 2016.

Q9.

Traditional ethnobotanical knowledge is deep, complex, and only partially known by the western world. In working with traditional ethnobotanical knowledge (TEBK) ethnobotanists are torn in how the TEBK should be collected, how it should be shared, and who it belongs to. Some ethnobotanists argue that TEBK should be treated as a global commons as knowledge should not be patented, it belongs to all who can benefit from it. Others claim that TEBK should be regarded as a private good and that intellectual property rights warrant the indigenous community to claim full ownership over their knowledge of the botanical world without sharing it with third parties if they so choose.

If TEBK was regarded as a global commons, there would be advantages for both the western world and the indigenous communities from where the information came. The unrestricted access to traditional medicines would open unprecedented doors for the medicinal field as new chemical compounds found from plants used by folk communities may provide cures for a multitude of diseases. This potential for rapid advancement in western medicine would ultimately lead to more funding available for researchers, including ethnobotanists, in seldom documented communities around the world. This would provide documentation of folk communities and the use-value of thousands of never before documented plants. This documentation and knowledge not being patented allows for the interdisciplinary analysis of ethnobotanical peculiarities and produce groundbreaking discoveries which may aid the conservation and development of natural environments. However, while there may be advantages to TEBK being considered a global commons, there are also an equal amount of disadvantages to the western world and indigenous communities if this were the case. If there

was unrestricted access to TEBK, folk communities would be at a severe risk of exploitation of their natural resources for a discovery that would economically benefit other players. This unrestricted access would then leave folk communities vulnerable to the threat of colonization and thus extinction and disappearance of any further traditional knowledge. While this may seem extreme, a less drastic and long term consequence of making TEBK a global commons is the tribe from who the knowledge was derived may not be compensated accordingly for their knowledge, so while the group that extracted the knowledge benefits the original benefactors see none. The western world may also reap the consequences of TEBK becoming a global commons if a botanical drug is patented and administered for a high price because of single-corporation ownership of the drug.

If TEBK was regarded as a private good, given rights over traditional knowledge would protect the intellectual property rights of indigenous people and communities and help prevent the exploitation of indigenous resources. This may also aid conservation efforts as the rate of extinction of plants due to indigenous consumption alone are exponentially lower than industrial cultivation would be. The downside to regarding TEBK as a private good would be the restriction of ability to produce life saving drugs because of ownership of knowledge. However, more funding into ethnobiology and medicinal plants could allow scientists to discover these chemically potent, life saving plants without the exploitation of indigenous people for their knowledge. There are also examples of international non-patent systems like through the Traditional Knowledge Digital Library (TKDL)[12] which provide information about traditional knowledge yet credit the information to the indigenous group. These non-patent knowledge

[12] Zent, Stanford. *Ethics and Ethnobotany.* 2019. Powerpoint Presentation.

databases provide a great method for documenting TEBK while simultaneously protecting it. Because of these reasons, I believe that TEBK should be considered a private good as it best protects and conserves indigenous groups and their relationship with their natural environment. If all TEBK was considered a global commons, I believe that the nature of the western world to colonize and quickly deplete natural resources would reap a bigger issue than would do good. The advancements that would come from medicine found through indigenous knowledge would not outweigh the harm caused by the environmental effects of deforestation and intellectual commodification.