

# Honoris Causa



Universitat de Lleida



**Rattan Lal**

*HONORIS CAUSA*

INVESTIDURA COM A DOCTOR  
*HONORIS CAUSA* DEL SENYOR

RATTAN LAL



**Universitat de Lleida**

Recull de les intervencions i lliçons pronunciades en l'acte d'investidura com a doctor *Honoris Causa* de la Universitat de Lleida del senyor Rattan Lal, que es va fer a la sala Víctor Siurana, el dia 13 de juny de 2017.

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## ÍNDIX

Benvinguda	
Dr. Roberto Fernández Díaz	5
Salutació	
Sr. Narciso Pastor Sáez	7
<i>Laudatio</i>	
Sr. Ildefons Pla Sentís	10
Acte de doctorat <i>Honoris Causa</i>	
Dr. Rattan Lal	15
Discurs de cloenda	
Dr. Roberto Fernández Díaz	22

# BENVINGUDA

DR. ROBERTO FERNÁNDEZ DÍAZ

Bona tarda, buenas tardes

- Secretària general de la Universitat de Lleida,
- President del Consell Social de la Universitat de Lleida
- Director de l'Escola Tècnica Superior d'Enginyeria Agrària de la Universitat de Lleida,
- Digníssimes autoritats acadèmiques i civils,
- Membres de la Comunitat Universitària,
- Senyores i senyors,

Benvinguts, bienvenidos, a l'acte d'investidura del senyor Rattan Lal com a doctor *Honoris Causa* per la Universitat de Lleida.

La importància i el valor que la universitat dóna a aquest nomenament, que és el més alt honor que aquesta institució concedeix, es posen de manifest en la solemnitat d'aquest acte, marcat per un ritual antic i d'un alt valor simbòlic.

# SALUTACIÓ

SR. NARCISO PASTOR SÁEZ



Magnífic rector, secretària general, president del Consell Social, Dr. Pla, Dr. Rattan Lal, autoritats, claustre de professors, estudiants, membres del PAS, senyores i senyors,

Per a l'Escola Tècnica Superior d'Enginyeria Agrària és un veritable honor poder incloure al seu claustre de professors una persona de prestigi, un professional honest i molt destacat en el seu àmbit de treball com és el Dr. Rattan Lal. Per a nosaltres és, sense cap mena de dubte, motiu de gran satisfacció i agraïment. Agraïment al rector i a l'equip de Govern de la Universitat, que han fet possible la petició dels departaments de Medi Ambient i Ciències del Sòl i de Producció Vegetal i Ciències Forestals, i també la de la nostra Escola, i agraïment al Dr. Rattan Lal per haver acceptat compartir amb nosaltres i els nostres estudiants la seva saviesa, la seva experiència i els seus projectes, que, a partir d'ara, també són els nostres.

Com sabeu, l'Escola Tècnica Superior d'Enginyeria Agrària ha recorregut un llarg camí, de més de 45 anys, gràcies a l'esforç de molta gent, la qual cosa ha permès situar la nostra escola com a referent en l'àmbit agroalimentari, tant a escala nacional com internacional. Nosaltres som hereus d'aquest gran llegat, però també de la responsabilitat d'honrar-lo i, per tant, d'assumir el compromís de fer-lo més gran, sent conscients de tot el camí recorregut durant aquests anys, però especialment de tot el que encara ens queda per recórrer.

The University of Lleida, and more especially the ETSEA carry out research and teaching in areas of soil and water conservation, carbon sequestration, climate change effects and sustainable land development and adaptation, areas in which you are a reference. This is the reason why we need people like you Dr. Rattan Lal, your firm commitment, your expertise and your world view, to help us broaden our knowledge in these areas, and respond to the challenges posed by our changing times.

Les magnífiques i merescudes paraules del Dr. Pla han deixat total constància de les virtuts de la persona que avui ens honra amb la seva presència.

Per això, digníssimes autoritats acadèmiques i claustrals, considerats tots els arguments i exposats tots els fets, sol·licito amb tota consideració i prego que s'atorgui al Dr. Rattan Lal el grau de doctor *Honoris Causa* per la Universitat de Lleida.

Moltes gràcies

# *LAUDATIO*

DR. ILDEFONSO PLA SENTÍS

It is for me a pleasure and an honor to make this "laudatio" of Prof. Dr. Rattan Lal, as a recipient of the Doctorat *Honoris Causa* of the University of Lleida. Myself, I had the privilege of meeting him for the first time, although I already knew about his research work in the year 1974 (more than 40 years ago) in a visit to IITA (International Institute for Tropical Agriculture) in Nigeria, as part of a sabbatical year that I spent partially in W Africa. Since then we have had a continuous and fluid relation both at the scientific and personal levels. Also at that time, I met in Africa another good friend of ours, Dr. Eric Roose, who was working with ORSTOM, a French research organization, in the Ivory Coast. The three of us, from the same generation, have had parallel activities in the same area of research, Soil and Water conservation, and therefore we have met in many occasions in different meetings around the World, and in all occasions we have a photo together that reminds us of our friendly relationship. Regretfully, this time Eric, who now lives in Montpellier, is not able to accompany us due to his wife's health problems.

Moving on to the CV of Dr. Rattan Lal, we see that after difficult times when he was a young fellow, because his family had to move to India from Pakistan (West Punjab) as refugees in 1948, when India and Pakistan became separate countries after being part of the British Empire, he could continue his studies in India, reaching the B. Sc. in Agriculture and the M Sc in Soils, with very high qualifications. That is why he could get afterwards a scholarship to continue his studies for PhD in the Ohio State University in USA, finishing in 1968, the same year I got my PhD in the University of California.

Without going into many details, due to a lack of time, after finishing his PhD in Soils he got a job as Senior Research Fellow at the University of Sydney (Australia), and afterwards, in 1970, he started working as a Soil Physicists in the IITA (Nigeria), where I met him in 1974. He remained there, at the end as Coordinator of the Farming Systems Program. In the year 1978 I invited him, together with Dr. Eric Roose, as visiting

professor in the Postgraduate (Master and Dr.) Program in Soil Science that I had just organized in the Central University of Venezuela in Maracay, where I was working at that time. His great experience on management of tropical soils was very appreciated by our graduate students, and they also enjoyed the field trip we took across Venezuela looking at different problems related to soil and water management under tropical conditions. Of course, under very different circumstances to the ones that Venezuela suffers today. I also had the opportunity to visit Rattan several times, as an invited researcher, at IITA. From all these visits, I realized that under the very difficult living conditions in Nigeria (even though IITA had all of the facilities, but in a very closed and isolated location), he was able to work very hard, doing research related to the problems that he could see in the surrounding areas, and the problems he had been familiar with in his native India, and all that, according to my opinion, had a decisive and lasting influence on the kind, orientation and approaches of all his future research.

Looking again at his CV, we may appreciate that he has been very prolific in publications, in a number and quality that indicates the great time dedicated to it by Rattan, especially after moving in 1987, not without some immigration difficulties, as Professor to the Ohio State University, where he got his PhD back in 1968. Although all his research has always been directed at solving problems of soil and water management of agricultural soils, very early he realized the importance of the organic component of the soil, of the soil quality related to agricultural production and environmental protection.

When the topic of climate change, and specifically the global warming effect of the so called greenhouse gases became an important worldwide issue, he was one of the first to call attention to the influence that the soil C reserves, especially in the organic matter component, could have both in the increase or mitigation of global warming. As a result of this, he created the first Carbon Management and Sequestration Center of the World, in the Ohio State University, being its director up to now. Nowadays, it is very popular to talk about C sequestration, and there is mostly speculative and isolated research taking place in that direction, having in most of the cases as the unique and last objective the C retention or increase in the soil, without taking into consideration many other interrelated factors that could lead to scarce application of the results, and

worst of all, to some contradictory or non sustainable effects. An example of that is the present boom in research about the use of biochar as an effective way to sequester C. Instead of this, in all the research done and directed by Rattan Lal, he has always emphasized the influence of soil and land management on the C budgets, considering that the best way to contribute to sustainable C sequestration in the soil are good management practices, not only with the objective to increase the C in the soil, but also to improve their sustainable productivity. That is why many of his publications and lectures over the last few years have been focused not only on the relationship of soil C sequestration with climate change, but on their relationship with food production and food security. For that, his experiences in his native country India and in African countries have been very important.

Besides the enormous research work on those very important issues, Rattan Lal has dedicated much time and effort to the formation and orientation of many PhD students, and to making a wide dissemination of the results of his research, in numerous publications at different levels, in a way that they could be understood by scientists in different related research areas and even by the decision makers. That is why he is probably the most consulted and cited author in publications on very different topics of soil and water conservation and degradation, affecting climate change, food production and environmental protection.

As a result he has been invited to give many lectures all around the world, and he has occupied many leading positions in different worldwide organizations, like the presidency of WASWAC, ISTRO, ASSS, and now the Presidency of the International Union of Soil Science (IUSS), which will have its next World Congress in Brazil in 2018. Among those responsibilities, he was also a member of the Workgroup of IPCC (Intergovernmental Panel on Climate Change), between 1993 and 1996, and as such he was one of the recipients of the Nobel Peace Prize Certificate in 2007. He has received many other honors, like the Borlaug Award and the Hugh Hamond Bennet Award, one for the contribution of reducing food problems and the other for contributing to soil and water conservation, and he has also received the Doctor in Science *Honoris Causa* from Universities in Germany, Moldova, Norway and India. Now, already retired, he is

a Distinguished Professor of Soil Science of the Ohio State University, and even with some limiting health problems, he keeps active in writing articles, and editing books, all dedicated to emphasizing the importance of soils and their wise use and management, at a worldwide level, to mitigate climate changes and to provide the increasing food requirements of the world population, and giving lectures like the one he gave yesterday in the opening of the CONSOWA Conference.

I want to finish this "laudatio", saying that the UdL is honoring a man that has dedicated his entire life to continuous research activities in Soil and Water Management under Global Change—the theme of our CONSOWA Conference during this week at the UdL—always with a very open and non-dogmatic orientation, interpretation and dissemination through numerous publications, and focused on solving the most important present and future problems of the world population related to the interaction of climate change, food production and environmental protection.

ACTE DE DOCTORAT *HONORIS CAUSA*

DR. RATTAN LAL



## Soil Health and Global Issues

*Carbon Management and Sequestration Center, The Ohio State University, Columbus, OH 43210*

I thank the Rector, Prof. Dr. Roberto Fernandez Diaz, Prof. Dr. Ildefonso Pla Sentis and other members of the Award Committee for the great privilege and honor of receiving the Honoris Casusa degree from the prestigious University of Lleida. I am delighted to be here.

Soil health and its importance have been recognized by humanity for millennia. The Bible depicts Moses stating around circa 1400 BC as they entered Canaan. "See what the land is like and whether the people who live there are strong or weak, few or many. What kind of land do they live in? Is it good or bad?--- How is the soil? Is it fertile or poor? Are there trees on it or not? Do your best to bring back some fruit of the land" (Numbers 13:18-20).

A Spanish philosopher of Moorish origin, during the 12th century wrote in his book, Kitab-Al-Felaha (Book on Agriculture), "The first step in the science of agriculture is the recognition of soils and of how to distinguish that which is of good quality and that which is of inferior quality. He who does not possess this knowledge lacks the first principles and deserves to be regarded as ignorant... One must also take into consideration the depth of the soil, for it often happens that its surface layer may be black."

The importance of soil health in global issues is more enhanced now than ever before, and the need to restore and manage soil health must be widely recognized for addressing the global issues.

Important among global issues of the 21st century are: advancing food and nutritional security, mitigating and adapting to climate change, improving quality and renewability of water resources, enhancing biodiversity, improving human wellbeing and ending poverty. Most of these issues are also listed among the Sustainable Development Goals (SDGs) of the U.N. or the 2030 Agenda. Soil health and its sustainable management are critical to addressing these issues. Indeed, soil matters, and it matters in a highly critical manner.

These global issues are likely to be exacerbated with the growth of the world population, increase in the affluence of its lifestyle, and growing urbanization. The world population of 7.5 billion in 2017 is projected to increase to 9.7 billion by 2050 and 11.4 billion by 2100, with most of the future increase occurring in developing countries, where soil resources are already under great stress. Globally, there are 795 million food-insecure people and an additional 2-3 billion who are prone to malnutrition or hidden hunger, and both of these concerns are closely linked to soil health. The health of soil, plants, animals, people and ecosystems is one and indivisible.

Global urbanization is an anthropogenic force of the 21st century. Urban population, as a % of the total population, was 2% in 1800, 14% in 1900, 30% in 1950, 50% in 2008, and is projected to be 61% in 2030, 66% in 2050, 76% in 2075 and 84% in 2100. There will also be a growth in the number of megacities – cities of >10 million population. The number of megacities was 3 in 1975, 10 in 1990, 16 in 2000, 28 in 2014, 31 in 2016, and will be 37 in 2025, 41 in 2030, 50 in 2050, 70 in 2075 and 83 in 2100.

It takes 40,000 ha to provide accommodation and infrastructure to 1 million people. An annual increase of the world population by 75 million, takes 3 million hectare of prime agricultural land out of production. Each km of interstate highway can promote 100-120 ha of suburban growth. A city of 10 million requires 6,000 tons of food per day. All plant nutrients brought into the cities must be recycled to produce 10-20% of the food consumed within the city through one form or another from urban agriculture.

Global fertilizer consumption has increased from 10 million tons in 1950 to >200 million tons in 2017. Global pesticide use is 2 million tons of which 45% is used in Europe and

25% in USA. World irrigated land area has increased from 50 million ha in 1900 to 325 million ha at present. The sediment transport in rivers of the world has increased from 14 gigaton/yr during pre-historic times to 36.6 gigaton/yr at present. Agroecosystem soils are highly vulnerable to erosion, depletion of soil organic carbon and nutrients, salinization and other forms of physical, chemical and biological degradation. Precious soil resources, finite and non-renewable over the human timescale, must never ever be taken for granted.

While the global average yield of cereals has increased from 1.4 tons/ha in 1950 to 3.25 tons/ha at present, it must be increased to 3.6 tons/ha by 2025 and 4.30 tons/ha by 2050. With the increasing use of animal-based diets in developing countries, the global average cereal yield must be increased to 4.4 tons/ha by 2025 and 6.0 tons/ha by 2050. Restoration of soil health is essential to enhancing agronomic productivity and narrowing the yield gap between the actual yield and potentially achievable yields.

Humans, only one among the 8.7 million known species on earth, are excessively using the earth's finite resources. 38% of the Earth's terrestrial surface is used for agriculture, 75% of agricultural land (3.73 Bha) is allocated to raising animals, 70% of the global freshwater withdrawals are used for irrigation, 30-35% of global greenhouse gas emissions are contributed by agriculture, and yet 1 in 9 persons is food-insecure, and 2-3 in 7 are malnourished. Thus, there is a strong need for the judicious use of soil and other natural resources.

There are several options for achieving food security. Important among these are: reducing food waste by as much as 30-40% globally, increasing access to food by addressing poverty, inequality, wars and political instability; improving distribution; increasing the use of pulses and plant-based diets, and identifying alternate sources of protein, accepting personal responsibility of not taking things for granted, and increasing agronomic productivity from existing land, restoring degraded soils, enhancing biological nitrogen fixation by legumes and converting some agricultural land for nature conservancy without any additional conversion of natural land to agro-ecosystems. Productivity must be increased through sustainable intensification and restoration of soil health.

There is no need for additional appropriation of land and water for agriculture. Rather, there is a need for sustainable intensification of existing land.

Sustainable intensification involves the strategy of producing more food from less land, less water, less input of fertilizers and pesticides, less use of energy, and less emission of greenhouse gases by enhancing the use efficiency and reducing waste.

There are three basic principles of sustainable soil management: (1) replace what is removed, (2) respond wisely to what is changed, and (3) predict what will happen from anthropogenic and natural perturbations, to enhance soil resilience.

Sustainable management is a state in which demands placed on the environment can be met without reducing its capacity to allow all people to live well, now and in the future. The four pillars of sustainability are: (1) Environmental, (2) Economic, (3) Social, and (4) Institutional. Thus, "sustainability" is integration or balancing of environmental, social, institutional and economic issues. "Sustainable Development" is "making people better off in an ethically-sound way"... Thus, it is important to reconcile the need for increasing food production with that of improving the environment, The environmental footprint of humanity must be minimized.

To achieve this, soil health must be improved and risks of soil degradation minimized. It is important to understand that when people are poverty stricken, desperate and starving, they pass on their sufferings to the land. Indeed, soil and landscape are mirror images of people who live there. It must be recognized that marginal soils cultivated with marginal inputs produce marginal yields and support marginal living. Good soils, cultivated with good practices, produce good yields and support good living. Therefore, the goal is "to use the best and save the rest."

Healthy soils are also integral to any strategy of mitigating global warming and improving the environment. Soil can be a source or sink of atmosphere CO<sub>2</sub> depending on land use and management. Sustainable management and restoration of soils have a C sink capacity of 1-3 GtC/yr with drawdown capacity of 0.5 to 1.5 ppm of CO<sub>2</sub>/yr. Thus, healthy soils must be an important part of the solution for climate change adaptation and mitigation.

Healthy soils are also essential to achieving global peace and stability. Degrading soils, recurring drought, low crop yields, perpetual poverty and hunger, desperateness and marginal living are as real a threat to global peace and security as are ICBMs and nuclear weapon proliferation. Therefore, restoring soil health is critical to reducing risks of civil unrest and maintaining global peace and tranquility.

Therefore, if soils are not restored, crops will fail even if rains do not; hunger will perpetuate even with emphasis on biotechnology and genetically modified crops; civil strife and political instability will plague the developing world even with sermons on human rights and democratic ideals; and humanity will suffer even with great scientific strides. Political stability and global peace are threatened because of soil degradation, food insecurity, and desperateness.

Mahatama Gandhi outlined seven sins of humanity:

- Wealth without work
- Pleasure without conscience
- Knowledge without character
- Commerce without morality
- Politics without principle
- Religion without sacrifice
- Science without humanity

State of the world per minute:

- Death from hunger: 15.6
- Deforestation: 24.7 ha
- Fresh water withdrawal:  $8.4 \times 10^6 \text{m}^3$
- Energy consumption: 1.05 PJ

- New motor vehicles: 160
- Urban encroachment: 5.7 ha
- Soil degradation: 9.5 ha
- CO<sub>2</sub> – C emissions: 20 Gg

Therefore, if Gandhi were alive today, he may have expanded the list of the sins of humanity and included the following:

- Technology without wisdom
- Education without relevance
- Humanity without regards to soil

Soil stewardship and care must be embedded in every fruit and vegetable eaten, in each grain ground into the bread consumed, in every cup of water used, in every breath of air inhaled, and in every scenic landscape cherished.

Soil is life and life is soil. Healthy soil is essential to a healthy life and a healthy environment.

Thank you.

# DISCURS DE CLOENDA

DR. ROBERTO FERNÁNDEZ DÍAZ

La Humanitat sempre ha estat preocupada pel seu futur. L'ésser humà sap que el seu present és en bona part la conseqüència del seu passat, però es pregunta especialment com seguir sent-ho creant cada dia el seu present-futur. És veritat que donem gran importància al pretèrit, però el freqüentem, sobretot, com un camp d'experiència que ens ha de servir per pensar i programar el nostre futur curt i el nostre futur llarg. Veiem el passat com un gran magisteri per a la vida present i per al nostre esdevenidor.

Es pensa, a vegades, que els historiadors som els encarregats de guardar la *memòria* del passat. No crec que sigui aquesta la tasca fonamental dels historiadors com a científics socials. És més, els aconsello que desconfiïn quan sentin la paraula *memòria* referida a un bon coneixement del passat. Els historiadors, en realitat, responem a una necessitat dels humans que consisteix a conèixer si hi ha regularitats en el nostre comportament en col·lectivitat. Els historiadors tractem d'analitzar si el funcionament i el canvi de les societats obeeixen a regularitats, que, una vegada identificades i conegudes, ens permeten estar en disposició d'actuar sobre la planificació del nostre demà col·lectiu. Incloent-hi, és clar, la regularitat de l'atzar, que sabem que existeix, tot i que encara no sabem com funciona. Els historiadors fem ciència per ajudar a entendre i dominar el canvi social que ens ha de conduir al nostre millor futur.

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Todo lo anterior viene a colación por una idea que me parece central en la personalidad y la trayectoria de nuestro doctor *Honoris Causa*, Rattan Lal. A saber: la ciencia no es sólo un motor fundamental para el cambio, sino que es un tipo de conocimiento de la realidad que aspira a encontrar las regularidades de la naturaleza y de la sociedad para poder dominar nuestro futuro. El futuro de la Humanidad está, pues, siempre presente en la ciencia. Y eso es particularmente evidente en el caso de aquellos científicos que



se dedican a analizar cómo el Planeta va a seguir teniendo la posibilidad de existir y cómo la Humanidad no lo va a impedir con sus propias actuaciones. Aquí se establece una dialéctica muy importante entre las regularidades propias de la naturaleza y las regularidades propias del comportamiento de la condición humana en sociedad.

Por eso me parece evidente que los científicos que analizan la naturaleza y los científicos de quieren comprender la sociedad deben colaborar con mayor intensidad con el objeto de proponer las bases que debemos establecer en nuestro modelo de sociedad para que la extinción de los humanos o del Planeta no sea responsabilidad de los primeros. Y, como hablamos de responsabilidad, es evidente que los filósofos de la moral también tienen grandes aportaciones que hacer, pues el comportamiento de lo humano es siempre axiológico, o sea, pleno de juicios de valor morales. Aquí la ética es imprescindible para establecer el necesario debate acerca de los valores morales en los que debemos sustentar nuestros modelos de sociedad; es decir, a qué debemos aspirar y a qué debemos renunciar es un dilema que incumbe a la reflexión ética. No basta con el conocimiento científico de la realidad presente, no basta con las predicciones de futuro basadas en la ciencia, sino que, a partir de esas bases objetivas, debemos reflexionar sobre los valores que deben alumbrar nuestra vida colectiva. Son los valores, más que la tecnología, los que van a decidir qué futuro vamos a vivir e, incluso, si vamos a tener futuro.

Pienso que la monumental obra científica y cívica de Rattan Lal obedece a estas premisas que acabo de desarrollar brevemente. Si repasamos su formidable currículum podemos apreciar que en su trayectoria hay un claro impulso cívico y ético que le lleva a un compromiso ecuménico con la Humanidad y con el Planeta. Como no conozco en profundidad su personalidad, no sé si fue la ciencia la que le condujo a la ética o fue la ética la que le impulsó a ser un científico. Con todo, no es la cuestión principal. La cuestión principal es que Rattan Lal investiga porque está emocionalmente preocupado por el porvenir de sus congéneres, actuales y futuros.

No se escandalicen si les digo que hay corrientes de pensamiento que justifican que no debe importarnos el futuro de la especie humana, dado que la vida no tiene ningún sentido y que lo realmente significativo es la existencia individual, que es única e irre-

petible, y que, en consecuencia, no tenemos por qué asumir responsabilidades sobre el futuro de los humanos. En aras de la libertad de pensamiento, nada tengo que decir contra el nihilismo existencial, salvo que yo me proclamo abiertamente contrario a él porque, entre otras cosas, si todos hubiéramos pensado igual, es bien cierto que entonces es más que probable que ni siquiera hubiéramos llegado hasta aquí.

Estoy seguro de que Rattan Lal no comparte las ideas nihilistas. Más bien me atrevo a afirmar que comparte la idea contraria del vitalismo comprometido: cada generación es responsable de gestionar el legado de las generaciones anteriores para acrecentarlo y dejar una herencia mejor a las siguientes. Todos los humanos, individual y colectivamente, somos herederos, hacedores y legatarios de sociedad. Todos nos subimos a las espaldas de las generaciones anteriores, creamos realidad social y legamos nuestras obras y las del pasado a quienes siguen la cadena de la supervivencia de la especie.

Y en ese legar un buen patrimonio para el futuro, la tarea de científicos como Rattan Lal es sencillamente fundamental. Sin ellos no podríamos conocer objetivamente la realidad para, de esta manera, poder proponer las buenas acciones que aseguren la supervivencia de la especie y del Planeta. Como diría nuestro querido rector Jaume Porta, que, por desgracia, no nos ha podido acompañar por un problema momentáneo de salud, debemos conocer el suelo, sus propiedades y sus comportamientos, porque en ello nos va la supervivencia alimentaria, es decir, nuestra perpetuación biológica como especie. Una supervivencia que Rattan ha demostrado que depende del uso racional y eficiente de las tierras y del agua para lograr su conservación en aras de la producción eficaz de alimentos de calidad y de un medioambiente biodiverso y sostenible de forma indefinida.

Ahora bien, la ciencia, por sí sola, no asegura el bien de la Humanidad ni el futuro del Planeta. La ciencia puede demostrarnos, empíricamente o con modelos matemáticos, cuál es la realidad actual y predecir con modestia en qué sentido puede desarrollarse en el futuro el comportamiento de la Tierra como sistema global e interdependiente. Pero lo que no puede hacer la ciencia es sustituir a la responsabilidad política. Creo que es por esta razón que Rattan Lal ha tenido siempre una clara conciencia de que el conocimiento científico debía complementarse con el compromiso cívico y el activismo político. Los estudios medioambientales deben vincularse con políticas medioambientales. Ciencia

y política, como siempre, deben dialogar y matrimoniarse. La política debe escuchar a la ciencia, pero la ciencia debe interpelar a la política. Para tomar buenas decisiones políticas necesitamos ciencia, pero la ciencia debe partir también de las necesidades sociales y ser estimulada por las decisiones de la moral y de la política. Cuando en 2007 se entrega el Premio Nobel de la Paz a Al Gore y al Grupo Intergubernamental de Expertos en el Cambio Climático, y, con ello, a Rattan Lal, se está haciendo un reconocimiento universal a ese matrimonio entre ciencia y política o entre política y ciencia. Una nueva política que tendrá necesariamente que volver a discutir las nociones de crecimiento económico, distribución de la riqueza social y territorial, calidad de vida sostenible, responsabilidad histórica y felicidad humana.

Pero a la gran política hay que estimularla desde las asociaciones y las instituciones científicas, profesionales y sociales. Un trabajo institucional de las asociaciones que reúne a los científicos para debatir entre ellos, a los estudiosos y a los políticos para confeccionar programas de actuación y también para la imprescindible tarea de concienciar a la sociedad de los grandes retos y de la necesidad de buscar soluciones concretas, globales y sostenibles a la vez. Si me permiten, diré que tan importante como investigar para conseguir conocimiento nuevo es transmitir los resultados para concienciar a las poblaciones humanas de los reales e inminentes peligros que corre el Planeta. Una tarea en la que también ha destacado nuestro doctor *Honoris Causa*, que siempre ha visto con meridiana claridad la necesidad de participar e impulsar asociaciones y congresos, como el felizmente celebrado en nuestra universidad —y aprovecho ahora la ocasión para felicitar a sus organizadores, con especial mención para el profesor Ildefons Pla y la profesora Rosa María Poch.

Sin embargo, la imprescindible tarea de concienciar a los ciudadanos de que las evidencias científicas sobre el futuro del Planeta deben hacerles reflexionar sobre la necesidad de reformar o cambiar el modelo de sociedad resulta una labor plena de dificultades. Desde los primeros movimientos conservacionistas del siglo de la Ilustración en torno a los bosques y las artes de pesca hasta los acuerdos de 195 países en París el 12 de diciembre de 2015, las voces que claman por un sistema social que respete y conserve a la gran madre Gaya han topado con demasiada indiferencia por parte no sólo de los

políticos, sino también de una mayoría de ciudadanos. Es verdad que en la actualidad las cosas han mejorado notablemente, pero no podemos relajarnos, porque siempre habrá un Donald Trump entre nosotros que defenderá los intereses de los poderosos en lugar de nuestro futuro.

Y no podemos relajarnos, además, porque la capacidad de deterioro del medioambiente que tuvo la Primera Revolución Industrial y la que posee el actual sistema productivo nada tienen que ver. No creo que sea exagerado afirmar que estamos ante la última oportunidad de salvar nuestra existencia como especie en un Planeta regenerado. Tengamos esperanza en que la racionalidad, la inteligencia y el miedo a desaparecer sean los que triunfen. Pero acompañemos nuestra esperanza con el activismo social y político que debería tener en las universidades una gran caja de resonancia.

Y acompañemos también nuestra esperanza con algo de *temor*, siempre necesario en la vida social para no acometer empresas que acaben con nuestra colectividad humana. Hace un par de años estuve en China en un viaje rectoral, visitando varias universidades. Pues bien, en una semana, desde Pekín a Shangai, no pude ver el cielo, oculto como estaba por una indefinida masa blanca. Entiendo que las autoridades chinas quieran sacar a sus ciudadanos de la miseria y situarlos en la clase media, pero a lo mejor en su loable intento se quedan sin país y sin ciudadanos. Las autoridades chinas, y no sólo ellas, claro, deberían tener temor a las consecuencias finales de sus políticas de desarrollismo industrial acelerado.

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Anem conclouent. Crec que la gran lliçó cívica del professor Rattan Lal és que la ciència serveix per millorar la societat amb la condició que en fem cas. I això vol dir que qual-sevol model de creixement econòmic i desenvolupament social que no contingui al seu si la perspectiva mediambiental posarà en perill la mateixa existència del que és humà. El sòl, l'aigua i l'aire segueixen sent, milers d'anys després que ens transforméssim en humans, el nostre principal capital per crear una Civilització perdurable. Estimant i admirant professor, per haver-nos demostrat científicament aquesta evidència i per haver lluitat perquè tots la coneguem, vostè forma part dels qui fan que la vida sigui millor per als

altres. I per això és per a tota la comunitat universitària lleidatana un veritable honor que vostè figuri a partir d'avui en el nostre claustre de professors. Confio que serem dignes de la seva generositat i de la seva grandesa.

Moltes gràcies.



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