

QUOTATIONS FROM ROGER REVELLE

Compiled by Deborah Day, Scripps Institution of Oceanography Archives
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RR ON ATMOSPHERIC CO₂/GLOBAL WARMING

“Thus human beings are now carrying out a large scale geophysical experiment of a kind that could not have happened in the past nor be reproduced in the future. Within a few centuries we are returning to the atmosphere and oceans the concentrated organic carbon stored in sedimentary rocks over hundreds of millions of years. This experiment, if adequately documented, may yield a far-reaching insight into the processes determining weather and climate. It therefore becomes of prime importance to attempt to determine the way in which carbon dioxide is partitioned between the atmosphere, the oceans, the biosphere and the lithosphere.”

--Revelle and Hans E. Suess, “Carbon Dioxide Exchange Between Atmosphere and Ocean and the Question of an Increase of Atmospheric CO₂ during the Past Decades,” Tellus IX (1957)pp. 19-20.

RR ON EDUCATION

“A graduate school is a place where professors make colleagues of their students.”

--Roger Revelle Papers MC6, Box 29, f 22" The Multiple Functions of a Graduate School," Princeton University, December 1958, p. 5.

“One characteristic of a research-oriented graduate school should be that it does not have too rigid a program -- too well thought out a plan. The essence of research is that it can't be programmed or planned. It differs in an essential way from the business of teaching the kind of systematic and well organized people who can start in September 1958 and guarantee that by June 1961 they are going to have a Ph.D. Instead of tidying up our graduate schools and our graduate programs...what we need if we're going to emphasize research, is to make them messier and more chaotic.”

--Roger Revelle Papers MC6, Box 29, f 22" The Multiple Functions of a Graduate School," Princeton University, December 1958, p. 6.

RR ON THE INTERACTION OF SCIENTIST AND POLITICS

“What, then, is the role of the scientist as a scientist in the realm of politics? It seems to me that the scientist can do five things:

First, he can emphasize the uncertainties that surround political action. This does not mean a negative iconoclasm but rather a healthy skepticism, an emphasis on the need for flexibility in not being too thoroughly committed to any set of so-called political principles.

Second, he can defend and promote his own political interest. He must jealously guard the freedom of research against political regulation. He must attempt to lower the barriers of secrecy and insist on the maximum of free communication between scientists. He must do all he can to insure free international interchange between scientists of different countries. He must insist on the need for sufficient effort and money for the education of young scientists. He must use all the political wiles of which he is capable to gain financial and material support for basic research.

Third, scientists should advise the politicians concerning technical change and its possible social implications. In the modern world the task of the politician is largely that of helping society adjust to the overwhelming

impact of technical change.

...

Fourth, the scientific community should devote part of its research effort to the long-range problems of society, such problems as the proper conservation and use of natural resources and the problems of human population control.

...

Fifth, scientific work on the problems of human motives, emotions and mental processes should be encouraged.

..."

--Revelle, "The Scientist and the Politician," 1957 UC Charter Day Address, UC Riverside 22 March 1957, p. 4-6. Roger Revelle Papers MC6, Box 29, f1.

"Whether the scientists like it or not, the mark of science is the determinate of the world to come and scientists therefore have a special responsibility for the political consequences of their work. Whether the politicians like it or not, their decisions and actions will be far worse than futile if they do not take account of technological change, and this can only be done through understanding of the nature of scientific discovery and its applications."

--ibid. P. 10.

RR ON OCEANOGRAPHY

"The fact is that we know less in detail about the shape of nearly three-quarters of the earth's surface than we do about the surface of the moon. I am speaking, of course, of the part of the Earth's surface which lies beneath the sea."

--Roger Revelle, "In these Days of Space Travel, n.d.

"The earth is full of wonders. We may not be able to imagine these until we see them, but by careful observation and clear-headed reasoning, it should be possible for us to understand them."

-- Roger Revelle, "The Past and Future of Ocean Drilling," 1981.

RR ON THE NAVY

"My reasons for applying for such a commission [i.e. commission in the Naval Reserve] were the result of the Bushnell experience; I felt that in any future oceanographic work on board a naval vessel it would be best to be able to give and take orders, rather than being in the anomalous position of a paying guest. This rather slight liaison with the Navy may also be of some future value to Scripps Institution; and in any case is good fun."

--Letter from Revelle to Harald Sverdrup, October 26, 1936, p. 2; in Roger Revelle Papers MC 6, Box 1, f54, SIO Archives UCSD.

RR ON HIS WORK AT SCRIPPS

"...in the long run I would be happier if I had more to do with the actual conduct of scientific research rather than with it over-all planning and coordination at the rather remote level of Washington."

--Letter from Revelle to Sverdrup, January 6, 1948 explaining his reasons for wanting to leave ONR and return to SIO. Records of the SIO Office of the Director, 81-23, Box 1.

"Until after World War II, the Scripps Institution was very remote from the rest of the university. It was almost never visited by the president or his staff, let alone those unimaginably grand creatures, The Regents. Their contact with Scripps can only be described as slight. They almost never thought about the Institution except at

budget time. One of them is said to have remarked, ‘So far as I can see, The Scripps Institution consists of only two things, a pier and a seawall, both in need of repair.’”

--Revelle, “The Adolescence of the Elephant,” a talk given at the 75th anniversary banquet, SIO 1978, p. 10

“It seems to be a requirement that to be director of the Scripps Institution one has to be a visionary with grandiose ideas and implausible plans.”

-- Roger Revelle, “Why is it called the Scripps Institution of Oceanography?” March 26, 1987.

“The whole enterprise was a field station of the University of California at Berkeley, one of whose regents had described it as consisting ‘mainly of a pier and a sea wall, both in need of repair.’ “

--Roger Revelle, “Scripps Institution of Oceanography - Its Evolution and Present State, August 1989

“In those heady days of the 1950's one could hardly go to sea without making an important, unanticipated discovery.”

--Roger Revelle, Scripps Institution of Oceanography - Its Evolution and Present State, August 1989.

RR ON TRENDS IN PHYSICAL OCEANOGRAPHY AND THE FUTURE OF OCEANOGRAPHY

“The fundamental doctrine of American geology in the late 1940s was that the continents and ocean basins had been permanent features of the earth’s surface, almost since the beginning of geologic time. The crust of the earth beneath the sea was unimaginably old, and the continents had always been about where they are today, though they had probably grown in size over several billion years. ... These doctrines received an abrupt shock in 1950 when shallow-water reef corals only about a hundred million years old were found on the flat-topped sea mounts of the Mid-Pacific Mountains at a depth of two kilometers, and when Russell Raitt’s seismic refraction studies indicated that the deep sea sediments over vast areas are only one or two hundred meters thick. ... Now fifteen years later, we know that none of these doctrines even resemble the truth.”

-- Revelle, “The Past and Future of Ocean Drilling,” 1975 speech, p. 1-2. Roger Revelle Papers, MC 6A, Box 159, f3.

“The large computers, with their ability to do something with literally millions of numbers, are revolutionizing physical oceanography. But they will be really valuable only to the extent that they can communicate with human beings, and the capacity of human beings to comprehend much at any one time is extremely limited. We need to make sure that our computers don’t simply talk to each other, and this means we must be able not only to talk to them but to understand what they are saying. We are faced here with the basic dilemma of scientific description, whether we are studying a single tree or the entire ocean. A complete description of our object of study would fill so many rolls of magnetic tape that it would be larger than the object itself, and hence useless for human comprehension. The dilemma is constantly changing. An understandable description of the ocean must always be an abstract model of some kind. But this requires more than description; it required simplification. Some simplifications come from understanding relationships; to summarize many data in a way we can understand, we can employ a set of generalizations or so-called scientific laws, the purpose of these laws being simply to state those underlying relationships between phenomena that make it possible to describe a great mass of data in relatively few words.”

-- Revelle, Presidential Address to the International Association for the Physical Sciences of the Oceans (IAPSO), XIV General Assembly at Berne, Sept-Oct. 1967. In IAPSO, IUGG Process-Verbaux No. 10, p. 6.

“..a disturbing problem: the centrifugal tendencies in oceanography. Our science is, in some sense, flying apart, exploding in terms of needs and demand and fragmenting in terms of people. There are many causes...: First is the growth in the numbers of oceanographers, and the sheer physical impossibility of their all meeting together at the same time and place...It is difficult to engage in a real exchange of ideas and knowledge in such a large group.”

--ibid, p. 8

“The second centrifugal tendency is the requirement for increased specialization. Our science is becoming so complex and far-reaching that one can’t know ... more than a part of it.”

-- ibid.

“Third is the development of local interests.” [reference to growth of site specific studies]

--ibid, p. 9

“Fourth is the growing tendency to relate aspects of marine research to particular basic sciences. The increasingly close relationship between applied mathematicians and theoretical fluid dynamicists, physicists and marine physicists, chemists and marine chemists, biologists and marine biologists are all occurring to some extent at the expense of the relationships among different kinds of marine scientists. ...”

--ibid.

“Fifth is the increased tendency to relate marine research to application.”

-- ibid.

“There are some centripetal tendencies which work in the opposite direction to bring different kinds of marine scientists together, and to join those from different countries. Among these are the growth in the last twenty years, of marine science laboratories and institutions, and of international marine science organizations. But the most important centripetal tendencies are still intellectual ones, the two overriding realities that the oceans are indivisible -- events in any part of the sea eventually have profound effects at great distances -- and that they belong to no man and no nation, yet are used by many men and many nations.”

-- ibid.

RR ON UCSD

“During the seven years from 1955 and 1961 I experienced the fierce joys of helping to found a new university. As with most things one does for the first time -- making love, becoming a father, getting a Ph.D. -- this task was approached with more enthusiasm than knowledge.”

--Revelle, “On Starting a University,” 1974

“The Committees on Educational Policy consisted almost entirely of professors from Berkeley and UCLA. They were experts at seeing clouds no bigger than a man’s hand. It was clear to them that a new graduate school would draw money away from their own campuses; it might even attract outstanding scientists who could better serve mankind in Berkeley or Los Angeles. They thought it would be nice to have an undergraduate school at La Jolla, managed by a farm team of dedicated teachers, which could provide well-trained new graduate students for their own laboratories. It was suggested that San Diego’s problems could be handled by locating an extension division of the UCLA College of Engineering in the city.”

-- Revelle, “On Starting a University,” 1974, p. 3. Manuscript prepared for but not published by Daedalus. In Roger Revelle Papers, MC6A, Box 158, f19, SIO Archives UCSD.

RR ON HIMSELF

“The ocean holds me in an enduring spell. Part of the spell comes from mystery -- the fourfold mystery of the shoreline, the surface, the horizon and the timeless motion of the sea.”

-- Scientific American, September 1969

“Being at the same time a sailor and a scientist just seemed too good to be true. Of course this meant that I would have to spend my life at an oceanographic institution...for a California boy, Scripps was the obvious choice, although Dr. Vaughan and the faculty didn't realize it, and I never actually told them, I just stayed.”

--Roger Revelle, “How I Became an Oceanographer and other Sea Stories,” Annual Review of Earth and Planetary Science, 1987.

EPILOGUE

Charles D. Keeling on Revelle (from KPBS 1992 program “Roger Revelle: Statesman of Science”)

“Roger Revelle was almost all things in science. He was an instigator, he was a philosopher, and he was an enabler.”

“He had quite a knowledge of the subject himself and so he had some ideas and these ideas that we had didn't always agree and so I had a number of occasions when I had to work with Roger and solve some of these problems. I think the most outstanding thing I can say is that Roger always respected other people's opinions, if they had any content, with this proviso that sometimes you felt embarrassed for what you had said afterwards”.

“He was a very good listener and if you weren't careful you could paint yourself into a corner before he would say anything, and he had an ability to look at you and his facial muscles would gradually relax and his jaw would drop a little bit more and a little bit more, until you realized that maybe you'd better reflect on what you've been saying.”