

Bob Rooney

Comments by Rooney

Feb. 14, 1976

p. 83 Voting rule? No unanimity. One man, one vote.

Underlifting:

1.2 makes small surplus in PAD 5

1.8 " large " , swamped.

This is unusual - that Sohio isn't ready.
Usually all lessees want to go.

p. 103 3 problems.

a. Under water, with the 15

b. Design for the fixed vol. only

c. Lose Mr. new.

Venez. had concessions of fixed time prod.

p. 120 Env. problems minimized

Use of prop. value changes to measure env. damage,
overlooks damage to bio. systems.

Norgaard

p. 3 says govt. of Alaska is not risk-averse. Maybe not.

p. Core hole costs $\frac{1}{3}$ or so of regular hole. Ind. drills some
~~them~~ pre-lease. Permit required.

"Stim hole" is $5\frac{1}{2}$ " at bottom. Is productive,
Reg. " is 10" " " "

"Pay zone" or "merrow rock"

p. 83 - would you recommend that agreement be unanimous before a unitization agreement is reached and the pool allowed to operate, or what ~~decision~~^{voting} rule would you use to set policy for the unit - see Buchanan & Tullock, Arrow, etc.

p. 103 - sale of fixed volume, like a fixed time period contract, runs into the problems of (a) inadequate maintenance of facilities as the fixed volume is approached, (b) facilities designed to produce the fixed volume and not what is there, and (c) a strong tendency to produce as fast as possible regardless of the effect on the recovery of oil that could be economic under the maximise DCF criterion.

p. 120 - measurement of environmental impacts by property value changes is faulty.

N., p. 3 - are petroleum firms more risk averse than Alaskans? Gov. may be very risk averse to ~~the~~ political effects of an "adverse" outcome (e.g., "giving away" a very valuable resource).

N, Rec 1A - Only "core" drilling to determine the geology of the structure is necessary - such holes are less expensive than producing wells and ~~after~~ ^{maybe} drilled as part of pre-lease exploration.

Long Beach

Dec. 7. I called Wilbur (Moose) Thompson, 590-5243
Mgr. of Long Beach Opns. Cal. State Lands Div.

Thompson was recommended by Don Ewert of Sect.,
who was contacted by Bob Paschall

He was out & I talked to David Hayward, Asst. Mgr.,
590-5244

1 Paschall says Ewert says indy. dislikes ~~net~~ profit concept
because of the audit feature. (By same token, this
shd. make State like it.)

2 91% of profit is working much like 40% royalty -
Paschall.

3 E. Wilcox field is old oil, controlled at \$4.50/bbl.

4 L.A. City taxes leasehold interest.

Bob Cook, 974-3341 is in charge.

This reduces profit, nearly dollar for dollar, and so
LA City taxes Long Beach and State of Ca.

5 Hayward says 'profit' is defined on cash basis. K expended.
However, the deal is they pay a min. 1/6 royalty
and then go to .91 profit, whichever is higher.
There was no profit until 1971

6 Hayward's office speaks of amortn., not deprecn.

7 The deal is not a lease, but a contract.

City of L.B. is operating agency for all the ownership interests. These include many upland homeowners.

8 Hayward recommends I see City of L.B., Dept. of Oil Props.
Leonard Brock, Genl. Mgr. 437-0041
Jim Wade
John Partin

1a Harbor Admin. Bldg., Pier J, near Qu. Mary.
[Follow L.B. Frey signs to Q.M. Harbor Admin. Bldg. is yellow, 6 stories. Brock on 3d floor.

9 Go to THUMS, Field Construction Office, for their views.

Ans for Long Beach

- 1 Effect on incentives of very hi % profit going to landlord.
Gold plating.
Union demands, cave in?
Tax " " " ?

- 2 What is profit?

To city, need FEA permission.

FEA Office of En. Impact
Vartkes Broussard, head
All look
Norm Brechner

Dave Shapiro, under Vartkes

Exxon study of Gulf of Mex. - John Gates - PhD works for
Les Cookinbor - used 3%.

p. 117. early shutdown not signif.

Mike Minga, Ph.D., Chicano, LB oil & Gas.
Try to see him.

Marshall Rose, USD, Budget section, interested in
profit-share bidding.

Recomm. Exp. Bidding, do not cite to FEA, but to
Rooney.

Research Expenditure Bidding, Rooney

1 p. 12 Learning curve theory applies to any new technique. It shd. also $\therefore$ apply in exploring new regions.

2 p. 13 Hi risk calls for using less durable, higher maintenance, capt. goods.

3 Rooney has social benefits of prospecting $>$ priv. But I'm wondering. The priv. benefits may exceed the social ones, when you find oil that someone else might find later.

From national view, energy cons. is massively subsidized. You may be helping society by hiding energy today.

Env. impacts are quite negative, too.

4 Why don't big firms use their credit as much as small?
a) They have internal funds, ^{even} cheaper.
b) They have better tax loopholes for equity capt.

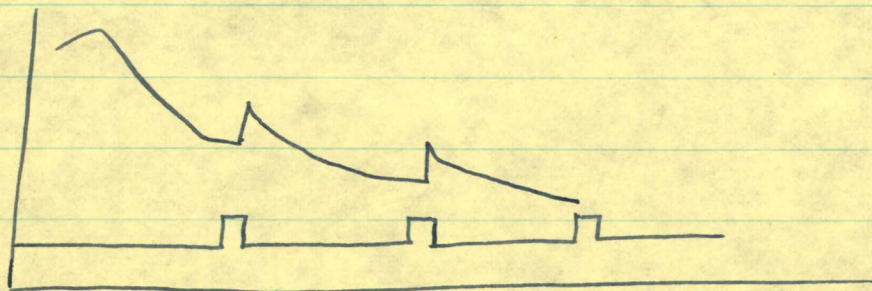
5 Rooney model has VC indep. of prodn.

That has to be an overstatement. There must be ways of Δ g prodn. by Δ g costs. The main one, tho, is Δ K cost of well capac., speed prodn.

But workover must also be a variable. You could

workover often in a more thoroughgoing way.

Now, actual decline must be sawtooth:



Rooney has just leveled out the workovers.

[Is also important to know effect of workover on physical waste, or ult. reserves. Does it just speed prodn., or Δ it?]

This relation naturally makes ~~cutoff~~ inputs more sensitive to royalties. The higher inputs may actually accelerate cutoff, so beware of allowing atmosphere in which "early cutoff" is identified w. all bad effects. Early reworking is desirable. High-grading is what we want to avoid.

Sawtooth decline needs a model to stipulate find opt. no. of workovers, & how royalty affects. Royalty will no doubt reduce opt. ~~the~~ freq., as well as cutting off the last ones.

High-grading means:

Leaving reserves in ground

Reducing inputs needed to get them

" " " " produce quickly

- 6 If profit share is ~~allowed~~ used, ~~and~~ and workovers are expensed, there is big bias for them.
- 7 Low i.s.r. on Gulf leases partly reflects unforseen Δ costs from for env. protn.
- 8 a problem w. work-commitment bidding. Early work may prove that further work is useless. Productivity is sequential - There must be ways out at several

Rooney Royalty Rate Policy

-1-

- 1 To box 'em in, have progressive royalty rate coupled w. time limit - ~~after~~ they have just 20 years, and pay 80% on all over 20,000 bbls/yr. per well - & limit no. of wells.
- 2 RR thinks no. of dev. wells is indep. of ρ royalty. Why? No dim. rets?
- 3 Royalties cannot be tax-sheltered - i.e., no write-offs. (but neither can net proceeds)
- 4 Bases of Rooney's case for royalties.
 - a. Assumes hi i for cos., low for gov. It naturally follows that govt. shd. do better taking the future \$.But Rooney himself questions the assumption, as do I.
- 5 p. 26 Rooney model has exp. decay of prodn. - but this actually understates prodn. in later yrs. of field life. Also, doesn't allow for redrilling wells, etc. "Workovers" -- normal practice, show of 2day recovery.
- 6 30% decline rates may happen early in life of well, but are much lower as a rule. p. 30. Rooney uses 10-25%.

Hyperbolic eqn. is better fit for decline rate of most res., when opd. at MER. p. 34 Hyperbolic or Arps eqn:

Rooney - 2

Arps eqn:

$$q_t = q_0 \left[1 + (b/a_0) t \right]^{-\frac{1}{b}}$$

where

$$a = -q/(dq/dt)$$

$$b = \frac{-d\left(\frac{q}{dq/dt}\right)}{dt}$$

Exponential decay fits early yrs better; Arps decay fits later yrs better.

[He shld. say what kind of drive is involved; & what the ops. is up to. If MER is used, then these decay rates are intl., not ec. or enrgy. They are based on Calif. studies by Higgins & Leachman, where probly MER not involved]

Rooney uses expl. This makes his physical waste less sensitive to royalty than it ~~shld.~~ really is; bes. real rates don't decline so fast.

He also has assumed const. prices. If they are actually rising, later yrs. rise in importance.

Seems to me a producer, cutting decline, will drill fewer, smaller wells, to stave off decline. My stuff didn't adequately allow for this.

He rules out 2dy rec. as being inc. for offshore fields.

He concludes that higher royalty rate will Δ pv of govt. revs., --- Δ from base of $1/6$ up to ca. 67%, and decline thereafter, for higher royalties. Not very striking or surprising.

But his conclusion comes out of a black box, p. 37. that reduction in reserves due to higher royalty rate is only negligibly greater for unexpl. fields than ~~low~~ high-yield ones. "Simulation analysis" = black box.

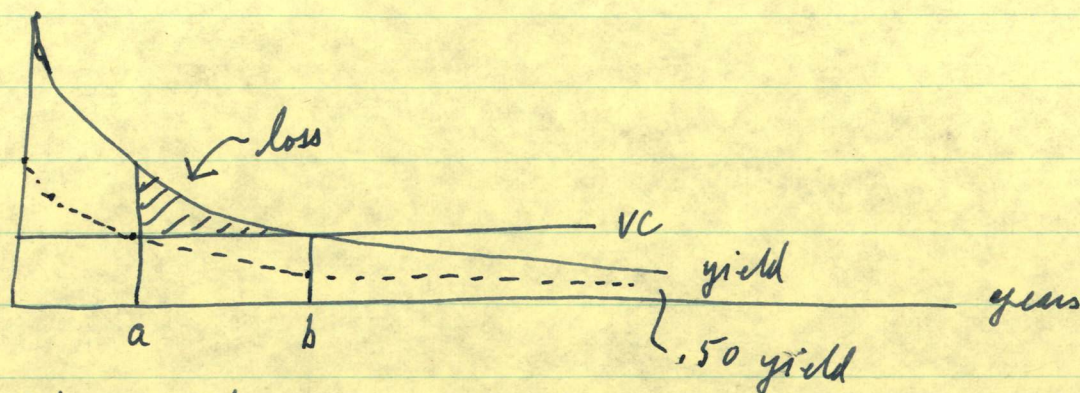
Rooney assumes certain K int. & opf costs, regardless of royalty rate. Does not $\therefore$ inquire if hi royalty wd.:

- a) Reduce lessee incentive to invest
- b) Defer opt. date for lessee to begin
- c) " " " " govt. to lease.

So, I can summarize Rooney by saying:

- he has built a model, based on expl. decline, & const. costs.
- it purports to show that early abandonment is a minor problem.
- he doesn't explain why the model yields the results it does, requires you take part on faith. But finding seems to follow from hi decline rates -- to p. 4

Rooney - 4



If yield declines 10% a year, how long does it take to cut yield in half? 7 years, or $6\frac{1}{2}$. So you cut out last $6\frac{1}{2}$ years prodn. Physical loss looks much larger than P.V. loss.

at 20% decline it takes ~~3~~ 3 years.

Gary Amstutz can run thru hyperbolic decline and see how that changes things

Another factor: Rooney is talking govt. revs, & inc. tax at 50% is big part of this. Wells are 70% expensable. This doesn't apply to Ak. royalty, or effects of royalty by itself (also royalty is only thing to vary)

Royalty wd. make you reduce well density, so as one lasts longer, declines slower

Rooney - 5

- 1 Rooney's model has Oil Reserves virtually independent of price. pp. 51-53

<u>Price of oil</u>	<u>Oil Reserves, at 0 royalty, 10% decay</u>
\$7	21.37
10	21.69
13	21.92

So his model clearly has a very sharp dropoff at tail. It is signif. then that reserves are much more affected by royalty rate than by price.

<u>Royalty rate</u>	<u>Oil Reserves, at \$7 oil, 10% decay</u>
0	21.37
1/6	21.09
1/3	20.76
1/2	20.12
2/3	18.8
5/6	15.08

It's not clear why halving the price has no effect, while ~~doubling the~~ a 50% royalty has quite a bit.

8

1.82 disaggregates

a) There is no as-you-go ungrad. effect, only end-of-life effect. Seems wrong.

- bringing end of life nearer As pv of depletion
- there is incentive to lower costs, use fewer wells

b) To be viable, a field must yield very large surplus in early years, bcs. it tapers off so fast -- if it does.
They come free

c) RR is treating workover costs as const. yrlly. flow. Actually they probably come every few years.

Lacking workovers, yield would decline faster.

[But this says that by spending more on workovers, field would decline slower. This is what royalty may discourage, ---

Let's compare a K-intensive vs. more labor-int. alt. K-way and L-way.

K-way, build big capac. up front, get rapid drop off

L-way, begin w. less capacity, spend more on later workover & maybe new drilling.

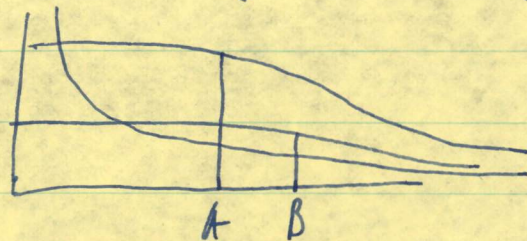
Royalty hurts the L-way. Doesn't affect K-way so much bcs. of rapid decay. Hurts even flow option.

Rooney, 7

- 9 The royalty is going to leave a large untapped surplus in early years, where 25% of c.f. is above costs, p. 82 e.g. a 50% royalty fails to tap that.

Needed: a royalty that declines w. decay of field, & takes 5-10 years to build up. So put it at 85% for 10 years, then drop it by $[d + .05]$ each year, where d is decay rate of field, or fields of like kind.

- 10 Rooney hasn't considered that royalties will reduce K input. The input A of well capacity may become subeconomic. That means fewer wells in a field; slower recovery. Strangely, that means longevity in wells, means higher K -int. Sub. K for L .
So, it will take longer to drain field



Move from A to B

This is intuitive. Royalty removes urgency to produce. You go to a slower rate.
[Use numerical ex. for Legish.]

This defers royalty revs. The lessee is in no hurry. The

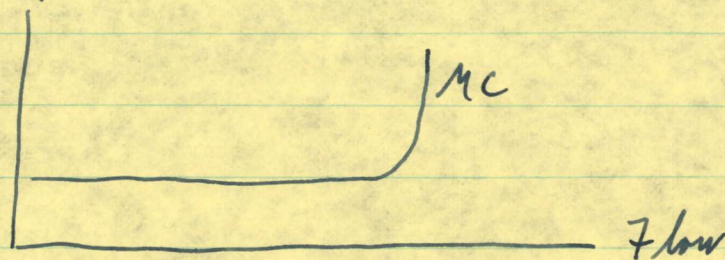
cost of delay is borne by lessee.

This is why lessee must impose work commitment.

✓ Recommend needed future research, as part of report.
Well spacing.

11 It cannot be that op. costs are indep. of what a well produces. If they were, you cd. produce it all right away at no extra cost. You can work anything harder.

It may be tho that in this case there is a capacity choke, well capacity, with SMC turning up so sharply they are L-shaped.



10 days before June 15. @ \$200.

250 when traveling.

Alta. system, you explore in a chkd. fashion.
(Tidewater - Getty & Conoco)

1 Case for royalty, & vs.

2 Long Beach

3 Research - exp. bidding

4. Review my rpt.

See NRJ, 10-68, article on shale-oil & bidding.

VITA

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Education

1. Ph.D. in Economics from Stanford University in June 1965. Dissertation was titled "Taxation and Regulation of the Domestic Crude Oil Industry."
2. B.A. and M.A. in Economics from University of California, Los Angeles in June 1959 and February 1961, respectively.
3. Honors included an Earhart Foundation fellowship in 1962-3 and Phi Beta Kappa in May 1959.
4. Graduate studies included work in general economic theory, corporate finance, money and banking, economic history and development, public finance, government and business, statistics, mathematical economics and econometrics, and mathematics.

Academic Experience

1. Professor (with tenure), Department of Economics, California State University, Long Beach since February 1970. Teaching areas are microeconomics, macroeconomics, environmental and natural resource economics, statistics, government and business, public utility economics, mathematics for economists, and complex engineering systems (in Civil Engineering Department). Was Director of the university's Center for Environmental Studies from October 1972 to August 1974. Received Distinguished Teaching Award from student fraternity (ODE) in academic years 1975-6 and 1974-5. *(Have been appointed Director of the Center for Economic Research for the 1977-9 academic years.)*
2. Part-time teaching at University of California, Irvine, Spring Quarters 1976 and 1974, taught course titled "Economics of Ecology" in the Program in Social Ecology. Also taught a course with the same title in the Winter Quarter, 1976, in UCI Extension.
3. Assistant Professor, Department of Economics, University of California, Los Angeles from July 1964 through March 1968 (acting status during the 1964-5 academic year). Teaching areas were principles for nonmajors, economic theory, natural resource economics, money and banking, government and business, and statistics.

4. Instructor, Department of Economics, Stanford University, Winter and Spring quarters, 1964. Taught courses on principles (micro-economics), natural resource economics (honors seminar), and government and business.
5. Part-time teaching at California State University, Long Beach from February 1965 through January 1968. Taught courses in economic theory and statistics.
6. Teaching assistant, Department of Economics, University of California, Los Angeles, Spring 1962 and Fall 1959 semesters.

Government Service

1. Commissioner, California Coastal Zone Conservation Commission, South Coast Region; appointed by the Senate Rules Committee in December 1972. Served as Chairman of the Commission from its organization in January 1973 to July 1973 and from June 1975 to June 1976, and as its Acting Executive Director from January to March 1973. Was responsible for preparation of the regional commission's energy planning element. Received Honary Service Award from California PTA for service on the commission and for speaking in Huntington Beach's elementary and high schools on ecology. (Term ends
Dec. 31, 1976)
2. Chairman, Citizens Environmental Advisory Committee, City of Long Beach from April 1972 to January 1973.

Business Experience

1. Qualified as an expert witness on economic losses for wrongful death and injury cases in the Superior Courts of Los Angeles and Orange counties and Federal District Court since 1970. Have served as a consultant to several companies in the energy and financial industries.
2. Senior Economist, Continental Oil Company, New York from March 1968 through January 1970. Areas of responsibility included general economic forecasting, studies of government tax and regulatory policy, and studies of the energy, petroleum and other industries. Also was periodically involved in evaluations of capital budget and five year plan proposals of operating divisions and writing speeches for company executives.
3. Senior Planning Analyst, Tidewater Oil Company, Los Angeles from June 1963 through November 1964. On educational leave from January through May 1964 (while teaching at Stanford), but acted as a consultant on the antitrust case U.S. v. Standard Oil Company (Indiana) et. al. Primary duties were to perform economic studies of the relative profitability of investments in oil and gas exploration and production. Also worked on development of the company's short-and long-range planning systems.

4. Research Analyst, Tidewater Oil Company, Los Angeles from January 1960 through January 1962 and during the summers of 1959 and 1962. Duties included studies of company and competitor marketing operations, development of service station location criteria, investment and profitability analyses, general economic studies, and development of computerized techniques for corporate long-range planning.

Military Experience

U.S. Army (Regular Army, Army Security Agency) cryptographer from March 1953 through December 1955. Served 18 months in the Far East. Presently in the inactive reserves.

Personal Data

1. Born on October 4, 1934 in Glendale, California; grew up in Atherton and Palo Alto, California.
2. Married Eleanor Sloan on July 3, 1960. Four children: Robert III, born 4/25/64; Maureen and Karen, born 5/20/66; and Joann, born 4/19/68.

Academic Publications

1. "Micro Analysis of Mobile Home Taxation, Comment," Land Economics, August 1968.
2. "Competitive Bidding for Mineral Leases," Natural Resources Journal, October 1968 (revised version available for private circulation).
3. Discussion of "Perfect Competition, Regulation and the Stock Market" by Harold Demsetz and "The Effectiveness and Effects of the SEC's Accounting Disclosure Requirements" by George Benston, in Economic Policy and the Regulation of Corporate Securities, edited by Henry Manne, 1969.
4. "Descartes' Rule and Multiple Internal Rates of Return," Western Economic Journal, June 1973.
5. "Wealth Maximization and Monopsony Pricing," Industrial Organization Review, Summer 1974.
6. "Southern California Energy Industries," Chapter 18 of Southern California Ocean Studies Consortium; A Summary of Knowledge of the California Coastal Zone and Offshore Areas, prepared for the U.S. Bureau of Land Management, September 1974.

7. "Economics, Environment, Politics and the Energy Crisis: Some Implications for Local Government," California State University, Long Beach, Public Policy Papers, 1974.
8. "Environmental Policy in the Current Economic Recession," in Robert Marlett (editor), Current Issues in Environmental Education--1975, The Ohio State University Press, 1975.
9. "An Economic View of the Coastal Plan," Cry California, Spring 1976, pp. 3-9.
10. Dollars and Sense: The Economic Context of the California Coastal Plan, Planning and Conservation Foundation, San Francisco, 1976 (synopsis of research report titled The Economic Context of the California Coastal Plan).
11. "Economics of Nuclear Power Plant Siting in the California Coastal Zone," co-authored with Michael Tennenbaum, in D. Gaskins and J. Rosse (editors), California Energy: The Economic Factors, Federal Reserve Bank of San Francisco, 1976.

Unpublished Academic Research

1. "Competition and Vertical Integration in the U.S. Oil Industry," co-authored with E. A. Thompson and R. L. Faith.
2. "Royalty Rate Policy for OCS Petroleum Leases: An Empirical/Simulation Study," prepared for the Federal Energy Administration, July 1976.
3. "The Economics of Research Expenditure Bidding for Federal and State Oil, Oil Shale, Geothermal, and Coal Leases," prepared for the Federal Energy Administration, September 1975.
4. "An Economic Analysis of Royalty Bidding for Federal and State Oil Leases," prepared for the Federal Energy Administration, May 1975.
5. Co-authored the "Energy Planning Element" adopted by the South Coast Region of the California Coastal Zone Conservation Commission, October 1974.
6. "Cost of Service Regulation of Natural Gas Producers," June 1973.
7. "A Restatement of Hirschleifer's Optimal Theory of Investment," November 1972.
8. "Dynamics of Automotive Air Pollution Regulation," manuscript April 1971.

9. "Toward a Theory of Nonprofit Institutions: Comment," co-authored with M. L. Larmore, 1970, rejected by the American Economic Review due to space limitations.
10. "The Legal and Economic Dynamics of State Regulation of Oil Production," presented at the University of Chicago Law School, January 1969.
11. "Research in Energy Economics and Public Policy," prepared for Resources for the Future, June 1967.
12. "The Benefits to the State of California of Unrestricted Bidding for the Seamless Tubing Requirements of the THUMS Project," co-authored with W. R. Allen (UCLA), prepared for the California State Lands Commission, April 1967.
13. "Technical Change and the Demand for Crude Oil in District V," December 1966.
14. "Oil Severance Taxes and State Prorating Policy," presented at UCLA faculty lecture series, May 1965.

Principal Speeches on Energy and Environmental Economics

1. "Nuclear Energy--An Economist's Perspectives on Its Use," presented at University of California, Irvine, May 10, 1976.
2. "Economic Impacts of the Coastal Plan: Measurement and Assessment," presented to the Real Estate and Construction Section, Los Angeles Chapter, National Association of Business Economists, October 20, 1975.
3. "The University's Role in Energy Policy Formulation," presented to a conference of California State Universities and Colleges faculty members and administrators, Los Angeles, April 1975.
4. "Energy Conservation and the Architect: The Challenge of the Next 25 Years," presented as the Keynote address to a conference sponsored by the four Southern California Chapters of the American Institute of Architects, San Diego, February 1975.
5. "Planning for Energy Conservation and Development: The Energy Element of the South Coast Region of the California Coastal Zone Conservation Commission," presented to the California Energy Planning Council, San Diego, October 1974.
6. "Energy and the Environment," presented as the keynote address to the Pacific Coast Joint Chapters of the Production Division of the American Petroleum Institute, Bakersfield, October, 1974.

7. "Energy Crisis? Yes! But Don't Panic," presented at the annual meeting of the Southern California Academy of Sciences, Fullerton, May 1974.
8. "Economic Impact of the California Coastal Zone Conservation Act," presented at a conference sponsored by the American Institute of Real Estate Appraisers, Los Angeles, December 1973.
9. "Economics of the Energy Crisis," presented at a conference sponsored by the Los Angeles section of the National Council of Jewish Women, November 1973.
10. "The Economics of Ecology," presented as the keynote address at a dinner sponsored by the Long Beach Chamber of Commerce, Long Beach, May 1973.
11. "Coastal Zone Regulation and the Environmental Impact Report," prepared for a symposium sponsored by Mt. San Antonio College, February 1973.