Universidad de Puerto Rico
Recinto Universitario de Mayagüez
SENADO ACADEMICO
Mayagüez, Puerto Rico

CERTIFICACION NUMERO 72-28

Yo, Gloria A. Viscasillas, Secretaria del Senado Académico del Recinto Universitario de Mayagüez de la Universidad de Puerto Rico, CERTIFICO:

Que en la reunión ordinaria celebrada el día 11 de mayo de 1972 este organismo aprobó con las modificaciones indicadas por el Comité de Asuntos Académicos, la PROPUESTA PARA EL ESTABLECIMIENTO DE UN PROGRAMA DE ESTUDIOS GRADUADOS CONDUCENTE AL GRADO DE DOCTOR EN FILOSOFIA EN CIENCIAS MARINAS, a ofrecerse a partir del Primer Semestre del Año Académico 1972-73 en el Recinto Universitario de Mayagüez.

Forman parte de esta certificación la Propuesta y el Informe del Comité de Asuntos Académicos.

Los cursos contenidos en el programa quedan sujetos a las recomendaciones del Comité de Cursos del Senado y su aprobación posterior por parte de este cuerpo.

Y para que así conste, expido y remito la presente certificación para ser considerada por las autoridades universitarias correspondientes.

En Mayagüez, Puerto Rico, a los quince días del mes de mayo del año de mil novecientos setenta y dos.

Gloria A. Viscasillas
Secretaria

Anejos

Universidad de Puerto Rico
Recinto Universitario de Mayaguez
SENADO ACADEMICO

INFORME

A : Señores Miembros del Senado Académico

DE : Comité de Asuntos Académicos

ASUNTO: PROPUESTA PARA UN PROGRAMA DE ESTUDIOS GRADUADOS CONDUCENTES AL GRADO DE DOCTOR EN FILOSOFIA CON ESPECIALIZACION EN CIENCIAS MARINAS

Con fecha 25 de enero de 1972, fue remitida al Comité de Asuntos Académicos, para su consideración y las recomendaciones pertinentes, la Propuesta para un Programa de Estudios Graduados conducente al Grado de Doctor en Filosofía (Ph. D.) con especialización en Ciencias Marinas. Conforme al procedimiento acostumbrado en el caso de programas graduados, la propuesta, que había sido aprobada por la Facultad de Artes y Ciencias en su reunión del 28 de mayo de 1971, fue también enviada al Consejo Graduado del Recinto para sus recomendaciones.

En una serie de reuniones dedicadas a este asunto, el Comité estudió los méritos de la propuesta, particularmente en lo referente a beneficios, calidad académica y costo del programa. Durante las deliberaciones, compareció ante el Comité en una ocasión el Director del Departamento de Ciencias Marinas. Además, tuvimos la oportunidad de visitar las facilidades de ese departamento en la Isla de Magueyes en La Parguera y la cámara hiperbárica recién instalada en el Hospital de La Concepción en San Germán.

Este informe está dividido en tres partes, como sigue:

1. Consideraciones generales sobre los programas doctorales
2. Consideraciones específicas en torno a la propuesta del Departamento de Ciencias Marinas
3. Recomendaciones

I. CONSIDERACIONES GENERALES SOBRE LOS PROGRAMAS DOCTORALES

El grado de Ph. D. representa el más alto nivel de aprovechamiento en preparación para la investigación y el trabajo creador. Tiene una larga tradición de excelencia académica, de la cual debe estar consciente toda institución que proyecta establecer un programa doctoral.

Los programas doctorales se deben montar sobre bases sólidas. Un programa de doctorado en un departamento debe ser resultado natural de un historial de excelencia académica en dicho departamento. Esto presupone un personal competente en la docencia y la investigación. Sobre todo, es de vital importancia la competencia en la investigación, ya que el grado de Ph. D. es fundamentalmente un grado orientado hacia la investigación. Los profesores deben ser activos en su campo de especialidad, constatado esto por el número y la importancia de sus investigaciones y publicaciones y por su interés y participación en los programas graduados y actividades relacionadas en la institución y fuera de ella.

Los programas graduados que se inicien debe partir de las necesidades sociales, del interés estudiantil y de las corrientes intelectuales y educativas

del momento. En Puerto Rico se necesitan personas con buena preparación académica en áreas especializadas y con la habilidad de enfrentarse a los complejos problemas de la tecnología moderna. Una de esas áreas es, sin lugar a dudas, el de las ciencias marinas.

Los programas de ciencias marinas en el mundo entero han aumentado rápidamente durante los últimos diez años y todo parece indicar que esta tendencia habrá de seguir por mucho tiempo. Puerto Rico se ha convertido en el mayor centro marino en el Caribe y probablemente en toda Latinoamérica, y el Recinto Universitario de Mayaguez, a través de su Departamento de Ciencias Marinas, está en posición de ejercer el liderato en un área de estudios para el cual tenemos los recursos naturales a nuestro alcance y una situación única no existente en universidad alguna del continente norteamericano.

El desarrollo y mantenimiento de programas doctorales de calidad requiere una inversión de tiempo y dinero que en términos de costo por estudiante siempre resulta mucho más alto que para los programas de Bachillerato y Maestría. Además de los fondos necesarios para la contratación de profesores de reconocido prestigio y la diversificación del cuerpo claustral, son imprescindibles recursos económicos adecuados para equipo de laboratorio, facilidades bibliotecarias, viajes, ayudantías, becas y facilidades físicas. Para poder llevar a cabo estos programas, se necesita imaginación y prudencia, y

una labor conjunta que propicie una utilización más efectiva de los recursos humanos, fiscales y físicos de la institución. Unido al desarrollo de programas doctorales debe ir el reexamen y fortalecimiento de los programas de Bachillerato y Maestría que son el fundamento académico de los estudios superiores.

2. CONSIDERACIONES ESPECIFICAS EN TORNO A LA PROPUESTA DEL DEPARTAMENTO DE CIENCIAS MARINAS

El programa de Ph. D. en Ciencias Marinas surge como parte de un plan de desarrollo de un departamento que desde sus comienzos se ha dedicado exclusivamente a ofrecimientos graduados a nivel de Maestría. Entre los objetivos de ese departamento figuran los siguientes:

a. Enseñar y adiestrar estudiantes graduados en los problemas de la investigación científica y desarrollar en ellos la inquietud del investigador.

b. Desarrollar y llevar a cabo programas de investigación marina con miras a lograr una mejor utilización y conservación de los recursos marinos.

c. Propiciar el desarrollo de un programa conducente al grado de Doctor en Filosofía en Ciencias Marinas.

d. Colaborar con otras instituciones en la solución de problemas relacionados con el mar.

Durante los últimos años, el Departamento de Ciencias Marinas ha estado cumpliendo cabalmente esos objetivos. De los 18 egresados con grado de Maestría hasta el presente, 7 son estudiantes doctorales en instituciones prestigiosas tales como la Universidad de California en Berkeley, la

Universidad de Cornell, la Universidad de Yale, la Universidad de Duke, la Universidad Estatal de Luisiana, la Universidad Estatal de Florida y la Universidad de Hawaii. Otros dos ya han recibido el grado de Ph. D. y uno de ellos se desempeña en la actualidad como Catedrático Auxiliar del Departamento de Ciencias Marinas. De los que no han seguido estudios doctorales, dos son profesores en otras instituciones de nivel universitario en Puerto Rico, uno ocupa un cargo con el Departamento de Obras Públicas, dos trabajan con el Gobierno Federal, tres son empleados del Departamento de Ciencias Marinas de la Universidad de Puerto Rico, y una está desempleada por razones personales.

La matrícula en el programa de Ciencias Marinas ha aumentado de un estudiante en 1966-67 a 34 estudiantes en 1971-72. Entre estos últimos, hay diez puertorriqueños y dos colombianos. De los 34, unos diez han manifestado interés en proseguir estudios hacia el doctorado, de aprobarse el programa.

La labor de investigación y de entrenamiento del personal del Departamento tiene ya reconocimiento internacional y muchos científicos de gran renombre han hecho uso de sus facilidades y laboratorios desde los días del Instituto de Biología Marina. De los 13 profesores del Departamento, 11 ostentan el grado de Ph. D. de universidades diferentes y uno está actualmente siguiendo estudios doctorales en los Estados Unidos. Entre todos, algunos de los cuales se desempeñaron en el antiguo Instituto de Biología Marina, han contribuído a la

literatura científica con más de 150 publicaciones al presente. En el Departamento de Ciencias Marinas, se han producido 41 publicaciones durante el período de 1966-67 a 1970-71, y hay algunos manuscritos sometidos que aún están bajo revisión editorial. El personal investigador del Departamento ha sido favorecido con donativos de investigación montantes a cerca de $600,000 que provienen de la Fundación Nacional de Ciencias, la Oficina de Investigación Naval, el Departamento de lo Interior, el Departamento de Salud, Educación y Bienestar y otras agencias del Gobierno Federal, además de algunas agencias del gobierno local. De la cantidad indicada, aproximadamente 33 1/3% pasan a los fondos de la Universidad de Puerto Rico por concepto de gastos indirectos.

En cuanto a facilidades físicas, las de la Isla de Magueyes y las del nuevo edificio de Física, Geología y Ciencias Marinas en el Recinto de Mayaguez habrán de satisfacer las necesidades básicas del programa propuesto. Cabe señalar que para el equipo, incluyendo equipo de laboratorio, de los nuevos edificios se ha recibido una asignación de cerca de $250,000 del Departamento de Salud, Educación y Bienestar.

Los recursos bibliotecarios incluyen las revistas de mayor importancia para los estudios de ciencias marinas. Además de la biblioteca especializada del Departamento, están disponibles los recursos de la Biblioteca General del Recinto de Mayaguez, del Recinto de Río Piedras, del Recinto de Ciencias Médicas, del Centro Nuclear y de la Estación Experimental Agrícola. En adición, hay intercambio continuo de publicaciones entre bibliotecas,

universidades, museos y laboratorios de los Estados Unidos e instituciones de otros países.

Los programas de Ciencias Marinas son, por su propia naturaleza, costosos. En el caso particular de la propuesta ante nuestra consideración, se necesitará un aumento de aproximadamente $80,000 en el presupuesto actual del Departamento de Ciencias Marinas pra poder comenzar el programa doctoral durante el primer semestre del año académico de 1972-73. En esta cantidad se incluyen partidas para la contratación de profesores visitantes y un técnico de equipo científico, para la compra de servicios y materiales, y para viajes.

3. RECOMENDACIONES

El Comité de Asuntos Académicos está plenamente convencido de que los logros académicos y de investigación obtenidos por el Departamento de Ciencias Marinas durante los últimos años lo capacitan para emprender una misión de la seriedad de un programa doctoral, con el establecimiento del cual se cumpliría la función de marcar una nueva ruta de la vida universitaria. Al igual que el Consejo Graduado, el Comité endosa la propuesta y somete a este Senado Académico las siguientes recomendaciones:

1. Que en la página 6, bajo Requisitos de Admisión, se cambie "un año fiscal de colegio" para que lea "un año de física de colegio".

2. Que en la página 7, bajo Programas de Estudio, se cambie la segunda oración para que lea como sigue: "Los consejeros serán cinco profesores de los cuales uno no puede ser miembro del Departamento de Ciencias Marinas".

3. Que en la página 8, bajo Cursos fundamentales de Ciencias Marinas, se cambie "geología marina" en la primera oración a "oceanografía geológica", y en la segunda oración, se sustituya "formar" por "tomar".

4. Que en el desarrollo del programa propuesto, se fomente una colaboración estrecha con el Centro Nuclear, la Estación Experimental Agrícola, el Instituto de Recursos de Agua y otros departamentos de la Facultad de Artes y Ciencias y de la Facultad de Ingeniería.

5. Que se apruebe, con las modificaciones indicadas, la propuesta para el establecimiento de un programa de estudios graduados conducente al grado de Doctor en Filosofía en Ciencias Marinas, y que se hagan las gestiones ante las autoridades correspondientes para que dicho programa comience a ofrecerse a partir del primer semestre del año académico de 1972-73 en el Recinto Universitario de Mayagüez.

6. Se dispone además que las Normas Institucionales sobre Programas Doctorales serán incorporadas a este Programa tan pronto sean aprobadas por este Senado Académico.

Respetuosamente sometido,

COMITE DE ASUNTOS ACADEMICOS

Eugene A. Francis

Eugene A. Francis
Presidente

1 de mayo de 1972

Universidad de Puerto Rico
Recinto Universitario de Mayaguez
Colegio de Artes y Ciencias
Departamento de Ciencias Marinas
Mayaguez, Puerto Rico

PROPUESTA PARA UN PROGRAMA DE ESTUDIOS GRADUADOS CONDUCENTES AL GRADO DE DOCTOR EN FILOSOFIA (Ph.D.) CON ESPECIALIZACION EN CIENCIAS MARINAS Y UN PLAN DE DESARROLLO DEPARTAMENTAL

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RESUMEN

El Departamento de Ciencias Marinas del Recinto Universitario de Mayaguez propone un plan de desarrollo departamental y un programa de estudios graduados conducente al grado de Doctor en Filosofía con especialización en Ciencias Marinas.

Se entiende que dicho departamento cuenta hoy con los recursos humanos, físicos y de laboratorio para empezar a admitir estudiantes aspirantes al doctorado. Para llevar el programa a su terminación se requerirá un aumento de $297,000 a su presupuesto anual en adición a unos $219,000 en mejoras permanentes. Este programa podría comenzar durante el primer semestre del año académico 1971-72.

TABLA DE CONTENIDO

Introducción y Exposición de Motivos

El mar constituye la última frontera de la humanidad en nuestro planeta. Atravesamos por un despertar súbito al descubrir que bajo la superficie del mar existe un inmenso territorio virgen que constituye un reto para el hombre, comparable a la exploración del cosmos pero infinitamente más prometedor en su potencial de explotación económica. Poseemos en la actualidad la capacidad científica y el conocimiento tecnológico para enfrentarnos a ese reto, pero si queremos obtener más del mar debemos empezar por adquirir mayor conocimiento sobre él. En el 1961, el Presidente Kennedy pidió al Congreso duplicar las asignaciones para las investigaciones oceanográficas y comentó lo siguiente:

> "El conocimiento de los océanos es más que una curiosidad científica. Nuestra propia supervivencia puede depender de ello".

Ahora que el público está más consciente de las muchas cosas que desconocemos del océano y de su contenido, tanto los gobiernos como las universidades han comenzado a responder. Los laboratorios marinos se han expandido rápidamente en los últimos 10 años y muchos estudiantes graduados capacitados se han entrenado en todos los aspectos de la oceanografía (1). Este interés no se limita a los Estados Unidos y todas las naciones marítimas están participando en este desarrollo (2). Alrededor del mundo, unas 50 embarcaciones de investigación están navegando los mares constantemente (3), unos 600 científicos trabajan en el mar, y alrededor de 3,000 de ellos estudian los resultados en laboratorios costaneros.

Según se ha desarrollado la oceanografía, se ha hecho evidente que existen muchas aplicaciones prácticas de la ciencia básica oceanográfica. A través de un entendimiento cabal del océano, seguido de una ingeniería imaginativa, podríamos hacer nuestras

defensas más seguras, mejorar significativamente la transportación marina, ejercer cierto control sobre el clima, y podríamos manejar una amplia reserva de alimento que automáticamente se renueva ella misma.

Descansa pues, en los gobiernos y las universidades el propulsar esta otividad tan significativa en el futuro desarrollo de la humanidad en forma análoga a los desarrollos en la tierra y en la industria que fueron impulsados enormemente en tiempos pasados por leyes y recursos que permitieron la creación de instituciones universitarias y de investigación, cuyos esfuerzos han propiciado en gran medida el progreso alcanzado en esas áreas. Ya el Gobierno Federal, en armonía con lo anteriormente expresado, aprobó en 1967 la ley que autoriza los Colegios "Sea Grant" y ya algunas universidades han sido designadas "Sea Grant College" y han recibido los fondos que tal designación conlleva.

La Universidad de Puerto Rico, y en especial el Recinto Universitario de Mayaguez, aunque en una forma limitada y modesta, puede considerarse como pionera en este campo, ya que desde hace 15 años ha tenido funcionando su Instituto de Biología Marina, hoy Departamento de Ciencias Marinas. La labor de investigación y de entrenamiento del Departamento tiene ya reconocimiento internacional y muchas figuras de gran renombre científico han hecho uso de sus facilidades y laboratorios, habiendo trascendido ya su nombre de las dimensiones hemisféricas para alcanzar mayores magnitudes (véase Apéndice 1).

Las autoridades universitarias del Recinto de Mayaguez, a raíz de la nueva ley universitaria, conscientes de la importancia, del potencial de desarrollo, y del gran prestigio y renombre que un programa de calidad y excelencia en el campo de las Ciencias Marinas puede traer a nuestra institución, han colocado el crecimiento de esta área en

una situación de alta prioridad y durante el transcurso de los pasados años se tomaron determinaciones para reforzar sustancialmente el personal científico del Departamento cuando se contrataron varios nuevos investigadores y profesores de reconocido prestigio (véase Apéndice 2). Con miras de alcanzar una utilización más efectiva de este personal adquirido, y en armonía con la política universitaria más apropiada de integrar hasta un máximo la labor de investigación con la labor docente, se propone un programa académico al nivel de doctorado que pretende hacerse cargo de la más alta responsabilidad de enseñanza e investigación en las ciencias marinas del trópico en nuestro hemisferio. A esa gestión docente responde esta propuesta.

Objetivos

1. Ofrecer enseñanza académica conducente al grado de Doctor en Filosofía en las distintas disciplinas comprendidas bajo Ciencias Marinas, y adiestrar estudiantes graduados en los menesteres y problemas de la investigación científica, desarrollando en ellos la capacidad y la inquietud para hacer investigación original.

2. Desarrollar programas de investigación marina con miras hacia una vida mejor para nuestro pueblo y la humanidad, y la mejor utilización y conservación de los recursos marinos.

3. Colaborar con otras instituciones en la solución de problemas relacionados con el mar.

Justificaciones

Los logros académicos y de investigación obtenidos por el Departamento de Ciencias Marinas durante los últimos años, lo capacitan para ofrecer el grado de Doctor en Filosofía. El programa propuesto capacitaría a nuestros estudiante para hacer investigación original en sus especializaciones que resulten en aportaciones significativas al saber humano.

Las ciencias marinas, como disciplina propia, enriquecen los conocimientos adquiridos en otras ciencias, y como ciencia natural, también aprovecha conocimientos de otras ramas en el estudio del mar. Para asegurar un alto nivel de excelencia y productividad en la implementación de nuestro programa, contemplamos la utilización de recursos humanos y materiales conjuntamente con otros departamentos y dependencias de este recinto, además de otras instituciones.

La utilización sabia de los recursos marinos requiere la colaboración de nuestro gobierno, la industria, y otras entidades para resolver los problemas relacionados con el ambiente marino. Esta colaboración está en armonía con la obligación de la Universidad de Puerto Rico, y tiene ya una perspectiva muy halagadora. Nuestro Departamento ya ha entrado en conversaciones con otros organismos e instituciones para el establecimiento de programas cooperativos en esta área (véase Apéndice Núm. 3).

Reglamentos Académicos del Programa

La admisión al programa, la institución graduada, y los requisitos académicos para este programa serán aquellos especificados en el Reglamento de Estudios Graduados del Recinto de Mayaguez de la Universidad de Puerto Rico, que aparece en el apéndice 4 y aquellos requisitos institucionales que hayan de tener vigencia sobre programas de doctorado. En adición a las reglas generales que se enumeran en dicho reglamento, se aplicarán adicionalmente las siguientes normas:

A. Requisitos de Admisión - Los solicitantes al programa de Ciencias Marinas deberán poseer un grado de bachillerato, o su equivalente, similar al conferido por la Universidad de Puerto Rico, con especialización en ciencias o ingeniería. Deberán tener aprobadas un año de biología, un año de química, un año de geología, un año de física de colegio, y matemáticas hasta cálculo diferencial e integral.

Se aceptará un máximo de 18 créditos graduados en transferencia de otras instituciones.

B. Requisitos de Idiomas - Todos los candidatos deberán tener un conocimiento funcional del Español y del Inglés. De no existir inicialmente esta condición, es menester que los estudiantes tomen las medidas apropiadas al comenzar sus

estudios en el programa para atender debidamente esta situación, ya que la enseñanza en la institución es de carácter bilingue. En adición, todos los estudiantes del programa deberán mostrar su capacidad para leer y traducir de otro idioma extranjero moderno en la cual haya suficiente literatura científica en la especialización del candidato. Dicho examen serán administrados en cooperación con los departamentos de lenguaje de la institución, en fechas anunciadas en el calendario académico institucional. En casos especiales se aceptaría un "lenguaje" de computadora como idioma extranjero.

C. Disertación - Dado el caso que el doctorado representa un grado de investigación se requiere una disertación de carácter científico y que constituya una contribución original al campo particular del estudiante. Un máximo de doce créditos serán otorgados al trabajo de investigación para la disertación, una vez esta sea presentada y aceptada por el comité del candidato.

D. Programas de Estudio - Los programas de estudio de los estudiantes serán establecidos por los comités de consejeros que se designen para cada uno de ellos. Los consejeros serán cinco profesores, de los cuales uno no puede ser miembro del Departamento de Ciencias Marinas. Estos cinco profesores determinarán los cursos requeridos en el campo de las Ciencias Marinas y los cursos relacionados en otros departamentos que el estudiante deberá tomar. El candidato deberá completar un total mínimo de sesenta (60) créditos, de los cuales no más de doce (12) podrán ser a nivel 551-559 de entre los cursos del departamento. Previa autorización del comité de consejeros, se puede solicitar crédito graduado-hasta un máximo de seis- para un estudiante

por cursos sub-graduados tomados en otros departamentos y que hayan sido considerado necesarios en el currículo del candidato. En algunos casos se exigirán cursos subgraduados, sin crédito graduado, para eliminar deficiencias.

Cualquier candidato doctoral que haya satisfecho los requisitos para la maestría podrá solicitar candidatura a ese grado. Sin embargo, una maestría no es requisito para ser candidato doctoral.

E. Cursos fundamentales de Ciencias Marinas - Se ofrecen cursos fundamentales en las áreas de oceanografía química, oceanografía física, oceanografía biológica y oceanografía geológica. Cada estudiante habrá de tomar cursos fundamentales en aquellas tres disciplinas que no sean su especialización. Estos cursos deberá ser aprobados con calificación de B o mejor.

F. Seminario Departamental - Cada estudiante deberá matricularse en el Seminario Graduado, CM 691-692, de 2 horas-crédito. Ya que este seminario representa presentaciones por conferenciantes e investigadores visitantes, se exigirá a los estudiantes que tomen el seminario cada año, aunque sólo en su último año recibirán crédito académico por el mismo.

Cuando el estudiante esté próximo a terminar su disertación, se requerirá que presente su trabajo de investigación en el Seminario Graduado con antelación a someterse a su examen final.

G. Lista de Lecturas - Cada estudiante deberá, durante el transcurso de su programa de estudios, leer una serie de referencias que han sido seleccionadas por ser consideradas claves en el desarrollo de las ciencias marinas. Durante

el examen final del estudiante, el comité examinador podrá hacer referencia a las lecturas y dirigir preguntas al estudiante sobre ellas. (Apendice 13)

H. Exámenes Preliminares - Para alcanzar la candidatura final al grado de Doctor en Filosofía el estudiante deberá sufrir no más tarde de su tercer año de estudios, una serie de exámenes preliminares escritos en las áreas en que se ofrecen cursos fundamentales en Ciencias Marinas (inciso E, página anterior). Si el estudiante fracasara en los exámenes preliminares, tendrá la oportunidad de someterse a ellos nuevamente, y sin penalidad, durante la próxima sesión académica, sea esta semestre regular o sesión de verano.

Una vez aprobados los exámenes preliminares, el estudiante deberá someterse a un examen oral. Este examen será administrado por el comité examinador, el cual podrá hacer preguntas sobre cualquier aspecto de las ciencias marinas. Si el estudiante fracasara el examen oral podría concedérsele una oportunidad adicional. Un segundo fracaso le eliminaría del programa.

Una vez aprobados los exámenes preliminares escritos y el examen oral, se le otorgará al estudiante la candidatura al grado doctoral.

El examen de defensa de disertación no se podrá administrar hasta tanto el estudiante haya satisfecho los requisitos de candidatura.

Facultad y Facilidades Para Ofrecer el Programa

A. Facultad

El Departamento de Ciencias Marinas tiene al presente personal científico y académico que se desglosa como sigue:

1. Catedráticos.....5
2. Catedráticos Asociados.....5
3. Catedráticos Auxiliares.....3

13

A base de preparación académica, la situación es la siguiente:

1. Profesores con Ph.D. 10
2. Profesores con M. S. 3

(dos cursan estudios doctorales en la actualidad).

Los grados de estos profesores han sido obtenidos en las universidades de Duke, Florida State, Oregon State, Chicago, Princeton, Pennsylvania, Harvard, Hawaii, Washington State, Cornell, Texas A & M y Purdue. La facultad actual ha contribuído a la literatura científica con más de 150 publicaciones al presente, y ha recibido un caudal de cerca de $250,000 en donativos y contratos de investigación que provienen de la Fundación Nacional de Ciencias, Office of Naval Research, Departamento de lo Interior y Departamento de Salud, Educación y Bienestar del Gobierno Federal, además de agencias del gobierno local. Se incluye en el apéndice 5 los "curriculum vitae" de este personal y los donativos de investigación recibidos en el Apéndice 6. En adición al profesorado del Departamento de Ciencias Marinas, un gran número de profesores cualificados de los Departamentos de Biología, Química, Geología, Física, Ingeniería Civil, Ingeniería Eléctrica, y el Centro Nuclear, brindaría su aportación directa al programa, ya sea a través de la enseñanza directa de cursos graduados en sus departamentos, con su participación en los comités graduados de los estudiantes del programa, o con su relación directa en los diversos proyectos de investigación de naturaleza interdisciplinaria en que ellos se desenvuelvan.

B. Facilidades de Biblioteca

La biblioteca del Departamento de Ciencias Marinas cuenta con más de 10,000 sobretiros catalogados, 500 libros, 200 revistas encuadernadas y 4,200 revistas sin encuadernar. Se añaden unos 750 ejemplares al año del presupuesto del departamento. En adición, se encuadernan las Contribuciones del Departamento de Ciencias Marinas de la Universidad de Puerto Rico anualmente, los cuales se hacen circular por 87 bibliotecas, universidades, museos y laboratorios de Estados Unidos y 85 instituciones en otros países. En canje, se reciben 106 publicaciones de las cuales 41 son revistas. Están disponibles, además, los recursos de la Biblioteca General del Recinto de Mayaguez, del Recinto de Río Piedras, del Recinto de Ciencias Médicas, del Centro Nuclear, y de la Estación Experimental Agrícola.

En el apéndice 7 se incluye un desglose de las revistas recibidas en el Departamento de Ciencias Marinas en la actualidad.

C. Facilidades para Investigación--

1. Laboratorio - Todos los miembros de la facultad del departamento se encuentran actualmente llevando a cabo programas de investigación en nuestros laboratorios en la isla de Magueyes. En Mayaguez disponemos del "Edificio de Pesquería", donde se encuentran las oficinas administrativas y la biblioteca.

En la isla de Magueyes contamos con ocho estructuras modestas que incluyen dormitorios, almacenes, talleres, cuarto oscuro, salones de clase y laboratorios. Uno de los edificios de laboratorio cuenta con un sistema de agua de mar corriente.

En el proceso de planificación de mejoras permanentes para el Recinto de Mayaguez se ha incluído la asignación de una ala del proyectado nuevo edificio de Física y Geología para el Departamento de Ciencias Marinas, construcción del cual habrá de comenzar antes de junio 30, 1970. Este edificio proveerá amplias facilidades para profesores y estudiantes graduados de este programa. El Consejo de Educación Superior aprobó una asignación de $450,000 para un nuevo edificio en la isla de Magueyes (véase Apéndice E). Los planos han sido confeccionados y han recibido ya la aprobación de la Junta de Planificación. Ya se han completado las pruebas del terreno y se espera comenzar la construcción durante el año 1970.

2. Equipo - Se cuenta con una cantidad considerable de equipo especializado para la investigación y la docencia, en el cual se incluye centrífuga refrigerada, equipo de cromatografía, espectrofotómetros, ultrafiltros, batitermógrafos, compresores, medidores de flujo, redes de plancton, rastras, chinchorros, fotómetro marino, mostreador Cairke-Bumpus, ecosondas, dragas, equipo de buceo, etc. En adición, dos de los nuevos profesores del departamento han traído consigo equipo científico adquirido por donaciones de fundaciones que rebasa en valor los $100,000. Se estima que la cantidad y calidad de equipo disponible mejorará continuamente, ayudado por los proyectos de los profesores que reciben donativos de fuentes externas.

3. Colecciones - El Departamento de Ciencias Marinas cuenta con una colección de estudio y referencia, en edificio propio, la cual está

creciendo activamente. Esta colección incluye 3,548 lotes de moluscos que sirvieron como base para la preparación del libro "Caribbean Seashells" (G. L. Warmke & R. Tucker Abbott, 1961, Livingston Publishing Co., 346 pp., 44 planchas, 34 figuras en el texto). Además se cuenta con la colección de corales que resultara del trabajo de C. Almy y C. Carrión-Torres (1963. Shallow-water stony corals of Puerto Rico. Caribbean Journal of Science 3: 133-162), una extensa colección de peces de unos 1,000 lotes de ejemplares, colecciones misceláneas de invertebrados locales, y una colección de algas de más de 7,000 lotes de ejemplares.

Cursos a Ofrecerse

Los cursos a ofrecerse por el Departamento de Ciencias Marinas, además de una lista parcial de los cursos que pueden resultar de utilidad al programa, aparecen en el apéndice 9.

Programa de Desarrollo

1. Facilidades Físicas

Las facilidades físicas existentes, y las facilidades programadas al completarse, habrán de satisfacer las necesidades básicas del programa propuesto (véase Apéndice 10).

Deben mejorarse, sin embargo, las facilidades del muelle en la isla de Magueyes de suerte que este pueda atender las necesidades de una embarcación mayor, y deben establecerse las facilidades de taller y mantenimiento adjuntos que el cuido y el funcionamiento de tal embarcación requiere.

3. Personal Docente

El personal docente con que cuente el Departamento de Ciencias Marinas en la actualidad es suficiente para comenzar el programa doctoral siempre y cuando se entienda que, una vez comenzado, se debe reclutar personal adicional que represente las siguientes disciplinas:

1. Oceanografía física: Para darle balance y amplitud al programa se debe incorporar al departamento otro oceanógrafo físico.
2. Meteorología: La meteorología tropical está intimamente relacionada con el océano. De hecho, ya algunas universidades consideran sus cursos de meteorología como cursos integrados de oceanografía. Nuestro programa debe gozar de un representante en este campo.
3. Bioquímica ó Química de Productos Naturales: De los cientos de miles de especies de organismos marinos tropicales, solo unos cientos han sido examinados farmacológicamente o desde un enfoque de productos naturales. Ya varios de nuestros estudiantes han manifestado intereses a lo largo de estas líneas en sus trabajos de tesis. Debemos incorporar personal especializado para aprovechar el recurso que los organismos de nuestra área nos ofrecen.
4. Geología ó Geofísica: Al igual que en el caso de la oceanografía física, debemos incorporar al departamento un geólogo adicional, o un geofísico, para darle mayor amplitud a este aspecto del programa.
5. Biología Pesquera: Los trópicos, por regla general, sufren de limitaciones en el aprovechamiento de sus recursos pesqueros. Nuestro programa necesita

de un biólogo pesquero adicional especialista en cultivos artificiales, mari-cultura, o en manejo de poblaciones.

6. Ecología de Contaminación: Esta nueva rama del saber que atiende los problemas de los efectos de la degradación ambiental habrá de cobrar una importancia extrema en los años venideros. Debemos asumir el liderato de estos estudios en los trópicos añadiendo a nuestro personal un especialista en este campo.

Mientras no se haya completado la construcción del nuevo edificio de Física-Geología y Ciencias Marinas en el Recinto, y mientras no se haya completado la construcción del nuevo edificio de Ciencias Marinas en Magueyes, no se debe pretender traer más de un profesor adicional por año. Sin embargo, si hubiera el espacio y las facilidades físicas, como las habrá una vez terminadas las obras de construcción de estos dos edificios, se podrían añadir varios profesores simultáneamente hasta satisfacer las necesidades señaladas.

4. Investigadores Visitantes

La imperiosa necesidad nacional de proveer facilidades de estudios e investigaciones marinas ha sido muy bien demostrada por la propuesta que generara Associated Universities, Inc., para establecer en Puerto Rico el laboratorio marino nacional. Limitaciones presupuestarias en la Fundación Nacional de Ciencias forzaron la cancelación de ese proyecto, hecho que le brinda entonces a Puerto Rico la oportunidad de proveer estas facilidades a la nación y al hemisferio, y de asumir el liderato en las ciencias marinas tropicales.

Para hacer hincapié en el tan importante rol que ha desempeñado nuestra institución como sede de investigaciones marinas tropicales o científicas del mundo entero, refiérase nuevamente al Apéndice 1, donde se enumeran, por año, los investigadores que se han aprovechado de nuestras facilidades.

Esta población transeunte de talento y destrezas ha sido recientemente muy bien aprovechado por nuestro departamento para beneficio de su personal y sus estudiantes, como puede verse en la lista de conferenciantes visitantes que se incluye en el Apéndice 12. Más significativa aún es la contribución que estos visitantes hacen en la enseñanza de contacto directo y la generación de ideas tanto a nuestros estudiantes como a nuestros investigadores.

El departamento está preparado para recibir un número de investigadores-colaboradores visitantes equivalente a tres cuartas partes del número de claustrales. O sea, que cuando seamos veinte profesores, estaremos preparados para atender quince colaboradores visitantes. Estos investigadores servirán de profesores, de instructores, de conferenciantes, como miembros adicionales de los comités de tésis y disertaciones de los estudiantes, y en otras capacidades de colaboración académica y científica.

Es para poder mejor aprovechar el recurso que estos visitantes representa que debemos establecer facilidades adecuadas de residencia en la Isla de Magueyes o en el área vecina a la misma en La Parguera.

5. Personal Técnico

De inmediato la necesidad más crítica de personal técnico es la que nos impone la reparación y el mantenimiento de equipo científico. Urge obtener los servicios de un técnico especializado que pueda atender el equipo de investigación departamental. El éxito de muchos programas de investigación a veces dependen de la accesibilidad a este tipo de destreza.

Embarcación

El Departamento de Ciencias Marinas cuenta con dos naves adecuados para la investigación en el mar.

1. R/V. MEDUSA es un camaronero rastreador de 58' de eslora, 20 toneladas netas, cuyo alcance comprende las Islas del Caribe y la costa sur americana.

2. Contamos además con la nave R/V CRAWFORD de 125' de eslora, 300 toneladas, cuyo alcance comprende todo el Caribe y el Atlántico Tropical. Esta nave está equipada para cualquier tipo de trabajo oceanográfico.

Presupuesto

A. Presupuesto Inicial	
1. Mejoras Permanentes en Magueyes	
a. Muelle	$ 75,000
b. Talleres y area de servicio	64,000
c. Residencias de visitantes	80,000
Total	$219,000
B. Incremento al Presupuesto Funcional	
1. Personal docente adicional, seis profesores a $15,000	90,000
2. Programa de Profesores Visitantes Viajes, ajuste de sueldos de sabática, etc.	60,000
3. Técnico de equipo científico	12,000
4. Equipo de Laboratorio	75,000
5. Servicios y Materiales	30,000
6. Mantenimiento Embarcación	30,000
Total	$297,000

Referencias Citadas

(1) Our Nation and the Sea. 1969. Report on the Commission on Marine Science, Engineering and Resources. U.S.G.P.O.

(2) Hiatt, Robert W. 1953. World Directory of Hydrobiological and Fisheries Institutions. A.I.B.S. viii and 320 pp.

(3) Oceanographic Vessels of the World. National Oceanographic Data Center, Washington, D. C.

Otras Referencias

University Curricula in the Marine Sciences and Related Fields. Academic Years 1969-70 and 1970-71 National Council on Marine Resources and Engineering Development. U.S.G.P.O.

Apéndice 1

Investigadores visitantes que han hecho uso de las facilidades de laboratorio del Departamento de Ciencias Marinas

Visiting Investigators
1962

Dr. & Mrs. Paul R. Burkholder, Lamont

Dr. Howard L. Sanders & Robert Hessler, Woods Hole Oceanographic Institution

Dr. Charlotte P. Mangum, Dept. of Zoology, Yale University

Dr. Howard T. Odum & Robert J. Bogers, Inst. of Mar. Sciences, Univ. Texas

Dr. Bruce Welch, Duke Univ.

Dr. Kenneth R. H. Read, Biological Lab., Harvard

Dr. Sidney O. Fogelberg, Gen. Biological Supply, Chicago, Ill.

Drs. John L. Blum, Lester Suloski, Guy Esposito, Gerald Daigler, Edward Hawro, Canisius College, Buffalo, N. Y.

Elba Más, Dr. Clive Mohammed, Dr. Roy Woodbury and Dr. Richard Levins, Univ. of Puerto Rico

Dr. Paul J. Spangler, U. S. National Museum

Dr. Edward C. Raney and Gilbert Bane of Cornell University

Dr. Donald P. de Sylva of the Marine Laboratory of the University of Miami

Dr. Marcelo Bertholds of Salermo College

Dr. Henry Coomans of the American Museum of Natural History

1963

Dr. Jan Stock, Curator of Crustacea, Amsterdam Museum

Dr. & Mrs. Paul Burkholder, Lamont

Dr. Jean Allen, Wilson College

M. J. Roede, a graduate student of the University of Amsterdam

Dr. Marcelo Bertholds, University of Maryland

Dr. Andrew Maretzki, School of Medicine of the University of Puerto Rico

Raymond T. Damian, Florida State University

William Davis, Marine Laboratory, University of Miami

Dr. James E. Bohlke, Academy of Natural Sciences of Philadelphia

Dr. Howard J. Teas, National Science Foundation

Dr. James Olsen, University of Florida

Dr. Dan E. Feray and Dr. Neil Hulings, Texas Christian University

Dr. Charles Gifford, Alfred University

Dr. Klaus Rutzler, University of Vienna

Dr. P. Wagenaar Hummelinck, Zoological Laboratory, State University at Utrecht

Dr. H. Steinitz, Hebrew University, Jerusalem

Dr. John Trinkaus, Yale

Dr. Walter Shepp, State University of New York at Buffalo

Mr. Gregory Bateson, Communications Research Institute, St. Thomas

1964

Mr. Frederick H. Berry of the Fish and Wildlife Service at Brunswick, Georgia

Dr. Walter Shepp, State University of New York at Buffalo

Dr. Adolph Seilcher, University of Goettingen

Dr. D. A. M. Chickering and Dr. Ira Rubinoff, Museum of Comparative Zoology, Harvard University

Dr. Hans Brattstrom, University of Bergen, Norway

Dr. Frank Farrar and Dr. Charles Farrell, Vanderbilt University

Miss Alicia Hills of Life magazine

Mr. Philip Livingston of the Livingston Publishing Co., Narberth, Pa.

Dr. and Mrs. Gustavo Candelas, University of Puerto Rico, Rio Piedras

Dr. Gustavo F. Pulitzer, Portofino (Genoa)

Mrs. Myvanwy Dick and Dr. William Newman, Museum of Comparative Zoology, Harvard

Dr. Carter Gilbert and Dr. Elizabeth Wing, University of Florida

Dr. Howard Teas, National Science Foundation

Dr. Eric Barham and Mr. William Bunton, Naval Electronics Laboratory at San Diego

Dr. Lawrence Slobodkin, University of Michigan

Dr. Sidney R. Galler, Biological Branch, Office of Naval Research

Dr. James Snodgrass, Scripps Institution of Oceanography

Dr. Roman Kenk, Library of Congress.

Dr. Richard Skahen, Steinhart Aquarium and University of California Medical School

Lamarr B. Trott and Dr. George Bartholomew, University of California at Los Angeles

Spencer Tinker, Honolulu Aquarium

ed, U. S. National Museum

Dr. Betty Twarog and Dr. Kenneth R. H. Read, Biological Laboratories, Harvard

Jean Morice, Laboratoire a l'Institut des Peches Maritimes, St. Barthelemy

Dr. K. Fischer, Germany

Dr. Fernando Cervigón, Estación Investigaciones Marinas de Margarita, Venezuela

Dr. James L. Yount, Florida State Board of Health

Dr. Evelina Ortiz, University of Puerto Rico, Rio Piedras

1965

Dr. Dorothy C. Saunders, Cape Haze Marine Laboratory

Dr. Kenneth Read, Boston University:

Dr. Michael Gochfeld, Dr. Luis R. Otero, School of Medicine, University of Puerto Rico

Lt. Jan Buyse, Royal Netherlands Marine Corps (a malacologist)

Dr. John Zeigler, Woods Hole Oceanographic Institution

Dr. Kenneth Gold, Lamont

James Tesler, Office of Naval Research

Dr. F. Bonet, Escuela Nacional Ciencias Biológicas, Mexico

Dr. Peter H. Klopfer, Duke

Mr. Maurice Rakowicz, Steinhart Aquarium, San Francisco

Dr. Abraham Lerman, Johns Hopkins University

Dr. William C. Boyd, Boston University

Dr. Barry R. Wilson, Dr. M. T. Ghiselin, and Robert Bullock, Museum of Comparative Zoology, Harvard

Mr. James Blaut and Mr. Herrick, College of the Virgin Islands

Dr. Jean Allen, Wilson College

Dr. Wendell K. Patton, Ohio Wesleyan University

Dr. Bruce B. Collete, Richard Whitelcather, Richard Roe, John Thompson, Tomio Iwamoto, George Miller, and Paul Struhsaker, U.S. Fish and Wildlife Service.

The Shark Research Panel: Dr. Perry Gilbert, Cornell; Stewart Springer, Fish and Wildlife Service: Dr. Albert L. Tester, University of Hawaii; Dr. Leonard P. Schultz, U. S. National Museum; Dr. Robert F. Mathewson, Lerner Marine Laboratory; Dr. Sidney R. Galler, Office of Naval Research; Dr. John R. Olive, American Institute of Biological Sciences; Cmdr. H. D. Baldridge, USN.

Dr. Rudolf Reinboth and Mr. and Mrs. Norbert Simon, Institut für Allgemeine Zoologie, Germany

Dr. G. H. Oslund, Institute of Marine Science, University of Miami

Richard F. Rooney and Herbert C. Eppart, U. S. Naval Oceanographic Office

Dr. I. E. Gray, Duke University

Dr. Paul R. Burkholder, Lamont

1966

Dr. Sven Ebbesson, Laboratory of Perinatal Physiology, National Institutes of Health

Dr. Richard L. Marland, Dr. Maitland Baldwin, Mr. Eckart Wipf, and Dr. Igor Klatzo, National Institute of Neurological Diseases and Blindness, National Institutes of Health.

Mr. Harvey R. Bullis, Jr., U. S. Fish and Wildlife Service

Dr. John Ryther, Woods Hole Oceanographic Institution

Mr. Felix Iñigo and Dr. Donald Erdman, Puerto Rico Fish and Wildlife Department

Mr. Felix Prieto, Department of Promotion of Puerto Rican Industries (Fomento)

Dr. J. C. Warner and Col. Robert A. Cliffe, National Academy of Sciences

Dr. Patrick Conley, Carnegie Institute of Technology

Dr. Athelstan Spilhaus, University of Minnesota

Dr. Elba Mas Hadden, Fordham University

Mr. Peter Bacon, University of the West Indies

Miss Vida Kenk and Mr. Robert Bullock, Museum of Comparative Zoology, Harvard

Dr. Rebecca Brown, Boston University School of Medicine

Dr. M. Jean Allen, Wilson College

Dr. David Miller, Curator, Dr. Richard Vahan, Assistant Curator, and Dr. Kenneth R. H. Read, New England Aquarium, Boston, Massachusetts

Dr. Giles Mead, Curator of Fishes, and Dr. Ruth Turner, Malacologist, both of the Museum of Comparative Zoology, Harvard

Dr. Betty Twarog, Tufts University

Dr. Sylvia Earle, Cape Haze Marine Laboratory

Dr. Raymond Cable with Mr. Noland and Mr. Cone, Purdue University

Dr. Robert W. Kraus, University of Maryland

Dr. Arland Carsten, Medical Department, Brookhaven National Laboratory

1967

Dr. Donald A. Ross, University of Alberta

Miss Nancy Cramer, U. S. National Museum

Dr. Mary E. Rice, U. S. National Museum

Dr. Ruth Turner and Arthur C. Johnson, Museum of Comparative Zoology, Harvard

Steven M. Stanley, Kline Geology Laboratory, Yale

Dr. Klaus Reutzler, U. S. National Museum

Dr. James C. Tyler, Academy of Natural Sciences

Mr. and Mrs. Thomas L. Richards and Mr. Robert Bullock; graduate students in the Department of Zoology, University of Maine.

Dr. Robert P. Higgins and Maxine McGinity, Wake Forest College

Prof. and Mrs. H. F. Mulligan and Mr. and Mrs. Ralph L. Mott, Cornell University

Dr. Arthur L. Colwin and Dr. Laura H. Colwin, Queens College

Dr. Rudolph Scheltema, Woods Hole Oceanographic Institution

Dr. E. H. Davidson, Rockefeller Institution

Dr. A. Lee McAlester, Peabody Museum, Yale

Dr. and Mrs. Claude E. Zobell, Scripps Institution of Oceanography, University of California

A study Committee from the Associated Universities, Inc., including Dr. Robert Ginsburg, Johns Hopkins University, Dr. Luigi Provasoli, Haskins Laboratories, and Mr. Lloyd Slater, Study Director

Another group from the Associated Universities, Inc., including Dr. T. Keith Glennan, President; Dr. John Ryther, Chairman of the Tropical Marine Biology Study Committee, and Mr. Slater conferred further with Institute and university officials April 29-30.

Dr. Alfredo Soler B., Universidad de Panamá

Dr. and Mrs. Francis G. Stehli, Western Reserve University

Dr. Arland L. Carsten and Dr. Bond, Brookhaven National Laboratory

Dr. Solon Gordon, Argonne National Laboratory

Visiting Investigators
1968

Karlyn Wenger, Johns Hopkins

Dr. M. Jean Allen, Wilson College

Michael Berrill, Princeton

Dr. Peter Glynn, Smithsonian Tropical Research Institute

Dr. Kenneth Read, Boston University

Dr. Sven Ebbesson, NIH, San Juan

Dr. Robert Kraus, University of Maryland

Mr. C. John Finlay, Newark, Delaware

Dr. L. Liddle, U. of California, Santa Barbara

Dr. Luis R. Otero, Director, U. P. R., Rio Piedras

José R. Ortiz and Angélica Muñiz, U. P. R., Rio Piedras

Dr. Stjekpo Golubic, U. P. R., Rio Piedras

Dr. Elaine Robson, University of Cambridge, England

Dr. & Mrs. Harold Barnes, Marine Station, Millport, Scotland

Dr. J. T. Baker, University College, Townsville, Australia

Dr. Jonathan Wittenberg, Albert Einstein, College of Medicine

Mr. & Mrs. Paul Shave, Marine Biological Laboratory, Woods Hole

Dr. & Mrs. Paul Burkholder, Lamont Geological Observatory, Columbia Univ.

Dr. Gilbert Rowe & Dr. Beth Burnside, Duke University

Dr. Frances G. Carey, Woods Hole Oceanographic Institution

Dr. Robert T. Wilce & Mr. Arthur E. Linkins, University of Massachusetts

Dr. Ruth Turner & Mr. Chris Johnson, MCZ, Harvard

Dr. Fred Rosenberg, Northeastern University

Dr. Howard Winn, Mr. Pierce Fenhagen, Rhode Island

Mrs. Susan Hammen, Mr. Stanley Cobb & Mr. Steve Rebach, Graduate School of Oceanography, University of Rhode Island

Dennis Powers, University of Kansas

Dr. John G. Vandenbergh, North Carolina, Dept. of Mental Health

Thomas L. Kopenheffer, University of Boston

Dr. Willard Hartman, Yale University

Dr. Thomas Waller, Paleobiology, U. S. National Museum, Washington

1969

Mrs. Barbara T. Gittins, University of California

Dr. Ruth Turner, Museum of Comparative Zoology, Harvard University

Mr. John Howard, Museum of Comparative Zoology, Harvard University

Dr. J. A. Ransbottom, University of Maryland

Mr. Richard Dehlinger, Museum of Comparative Zoology, Harvard University

Dr. Yata Haneda, Yokosuka City Museu, University of Japan

Dr. Sven O. E. Ebbesson, School of Medicine, University of Virginia

Dr. Roland Seymour, Department of Biology, University of Pittsburgh

Dr. G. Fred Lee, Water Chemistry Laboratory, University of Wisconsin

1969

Dr. Leon S. Ciereszko, Department of Chemistry, University of Oklahoma

David G. Campbell, Department of Chemistry, University of Oklahoma

Dr. Henry Rapoport, Department of Chemistry, University of California, Berkeley

1970

Dr. Julio García Díaz, U. P. R., Río Piedras

Dr. Ronald Davis, Colby College, Waterville, Maine

Dr. Frederick J. Vande Vusse, Gustavus Adolphus College, St. Peter, Minn.

Dr. Sven O. E. Ebbesson, School of Medicine, University of Virginia

Dr. Gary L. Miller, Department of Botany, University of Florida

Dr. Ariel Lugo, Department of Botany, University of Florida

Dr. James Jones, Florida State University

Herbert Austin, Florida State University

Apéndice 2

Facultad del Departamento de Ciencias Marinas

LISTA DE LA FACULTAD DEL DEPARTAMENTO DE CIENCIAS MARINAS

Nombre	Rango Académico	Educación Máxima	
Luis R. Almodóvar	Catedrático	Ph.D.	B.A. Instituto Politécnico de Puerto Rico M.S. Universidad del Estado de Florida Ph.D. Universidad del Estado de Florida
Donald K. Atwood	Cat. Asoc.	Ph.D.	B.A. St. Michael's College Ph.D. Universidad de Purdue
Paul R. Burkholder	Catedrático	Ph.D.	B.A. Dickinson College Ph.D. Universidad de Cornell
Máximo J. Cerame-Vivas	Director y Cat. Asoc.	Ph.D.	B.A. Universidad de Puerto Rico M.A. Universidad de Duke Ph.D. Universidad de Duke
Bertha M. Cutress	Asoc. Investig.	M.S.	B.S. Universidad del Estado de Oregón M.S. Universidad del Estado de Oregon
Charles E. Cutress	Cat. Asoc.	M.S.	B.S. Universidad del Estado de Oregon M.S. Universidad del Estado de Oregon
William Eger	Cat. Aux.	M.S.	B.S. Eastern Michigan University M.S. Universidad de Hawaii
Graham S. Giese	Cat. Aux.	Ph.D.	B.S. Trinity College, Hartford, Connecticut M.S. Universidad de Rhode Island Ph.D. Universidad de Chicago
Juan G. González	Cat. Aux.	M.S.	B.S. Universidad de Puerto Rico M.S. Colegio Texas A & M

William S. Maddux	Cat. Aux.	Ph.D.	B.S. Universidad de Manitoba M.A. Universidad de Princeton Ph.D. Universidad de Princeton
Francisco A. Pagán	Cat. Aux.	Ph.D.	B.S. University of Puerto Rico M.S. University of Puerto Rico Ph.D. Auburn University
Robert Y. Ting	Cat. Asoc.	Ph.D.	B.S. Universidad de Washington Ph.D. Universidad de Washington
Thomas R. Tosteson	Catedrático	Ph.D.	B.S. Universidad de Pennsylvania Ph.D. Universidad de Pennsylvania
John Zeigler	Catedrático	Ph.D.	B.S. Universidad de Colorado Ph.D. Universidad de Harvard

Apéndice 3

Documentación de instituciones interesados en programas en colaboración con el Departamento de Ciencias Marinas

Duke University Medical Center
DURHAM, NORTH CAROLINA

OFFICE OF THE DEAN
SCHOOL OF MEDICINE

December 7, 1967

POSTAL CODE 27706
TELEPHONE 919-684-3438

Dr. Maximo J. Cerame-Vivas
Universidad de Puerto-Rico
Recinto Universitario de Mayaguez
Instituto de Biologia Marina
Mayaquez, Puerto Rico

Dear Dr. Cerame :

The purpose of this letter is to assure you of the interest of the Duke University Medical Center in exploring the possibilities of establishing a long-term underwater habitat in a collaborative effort with your Institution. In particular, we are interested in finding out whether it will be possible to procure a site on Mona Island which would appear to be particularly suitable for this venture.

We are most pleased to be able to consider embarking on what seems to us an exciting, productive and rewarding project.

Sincerely yours,

William G. Anlyan, M. D.
Dean

WGA:rlr

Please reply to:
New York City
41 PARK ROW
NEW YORK, N. Y. 10038
Telephone: BArclay 7-8200

PACE COLLEGE

Westchester, New York
861 BEDFORD ROAD
PLEASANTVILLE, N. Y. 10570
Telephone: 914 ROgers 9-3200

February 6, 1968

Dr. Cerami-Vivas
University of Puerto Rico
Institute of Marine Sciences
La Paguera, Puerto Rico

Dear Dr. Cerami-Vivas:

I am writing to you at the suggestion of Dr. Paul Burkholder concerning the University of Puerto Rico's Institute of Marine Sciences. Pace College is very much interested in marine biology and would like to find out the possibility of becoming affiliated with your group. In fact, we have just completed our first winter intersession in tropical marine biology at the Caribbean Biological Centre in Port Maria, Jamaica. Our work is at the undergraduate level and our students are highly motivated.

If you like I would be most happy to meet with you at your Institute of Marine Sciences and discuss our needs and anything you may desire toward the possibility of our working together.

Thank you so much for your interest and consideration.

Best regards from Dr. Burkholder.

Yours sincerely,

Dolores E. Keller

Dolores E. Keller, Ph.D.
Chairman
Department of Biology

DEK:hr

STATE UNIVERSITY OF NEW YORK
INTERNATIONAL STUDIES AND WORLD AFFAIRS
PLANTING FIELDS
OYSTER BAY, NEW YORK 11771

OFFICE OF THE DIRECTOR
TERNATIONAL STUDY ABROAD

February 7, 1968

Dr. Maximo J. Ceram©-Vivas
Institute of Marine Biology
University of Puerto Rico
Mayaquez, Puerto Rico 00708

Dear Dr. Ceram©-Vivas:

Before too much more time passes I would like to get off a quick note to you to mention my sincere appreciation to you for all the interest you have shown in discussing the possibilities with us of moving our Marine Biology program to your Institute.

I shall be in touch with Dr. Snygg immediately about her pending trip and would expect that she will be in touch with you directly about the development of the program!

Again, many thanks for your most warm hospitality.

Sincerely yours,

Jeanne Brockmann

Jeanne Brockmann
Associate Director

JB/rd

Yale University *New Haven, Connecticut 06520*

DEPARTMENT OF BIOLOGY
Kline Biology Tower

February 26, 1968

Dr. Maximo Cerame-Vivas, Director
Department of Marine Science
University of Puerto Rico
Mayaguez, Puerto Rico

Dear Dr. Cerame-Vivas:

As you probably know, the proposal for a marine science center to be located on the West Coast of Puerto Rico has now been presented to the National Science Foundation by AUI. I do not know what the immediate fate of this proposal will be, but I am sure the long range perspective is good. Since my wife and I are planning to be in Puerto Rico from March 21 - 28, I should like to take advantage of this opportunity to visit the site of the proposed station and to discuss with you possible forms of cooperation between this proposed laboratory and your Department.

I should also like to explore with you the possibilities of cooperative training programs involving graduate students from the University of Puerto Rico and Yale. With reference to this latter point, I have in mind the possibility of accepting for graduate study at Yale for the first year or two a few students from Puerto Rico, and in exchange we would hope to send advanced graduate students to Puerto Rico to conduct a part of their thesis research. The natural resources available for certain kinds of research are excellent in Puerto Rico and quite deficient here at Yale. On the other hand, without seeming arrogant, I think I can fairly say that our capacity for providing excellent graduate student training in the first year or two for students from the University of Puerto Rico is excellent. Probably such an exchange between the two universities could be made without any financial burden to either of them.

One of my present students is making use of Ascidia nigra in his research, and I may want to collect some specimans at La Paraguera to bring back to him. Will your facilities there be saturated with visitors during the 21st - 28th of March? If not, perhaps my wife and I could put in a bid for accommodations for at least some of that time?

I am looking forward to my visit, and I hope to recapture some of the pleasant experiences I had when I visited Puerto Rico before.

Sincerely yours,

Clement L. Markert

Clement L. Markert
Professor and Chairman

CLM:mpl

Yale University *New Haven, Connecticut 06520*

DEPARTMENT OF BIOLOGY
Kline Biology Tower

June 13, 1968

Dr. Máximo Cerame-Vivas, Director
Department of Marine Science
University of Puerto Rico
Mayaguez, Puerto Rico

Dear Dr. Cerame-Vivas:

In furtherance of the exchange program between Yale and the University of Puerto Rico, we would like to explore the possibility of sending three Ph. D. candidates to do most of their thesis work during the coming year in Puerto Rico. At least two of these students will be under the general direction of Professor Willard Hartman who, in the past, has sometimes sent his students to Jamaica to conduct research in the general area of systematics and ecology. Now, however, we would like to send such students to Puerto Rico. Professor Hartman would like to visit the University to discuss possible arrangements for his students. He is free to go to Puerto Rico during the last week in June, and I am writing now to ask whether or not that would be a suitable time from your point of view for him to visit you and your department.

Will you be kind enough to reply directly to Professor Hartman indicating whether or not the last week of June would be a satisfactory time for him to visit and, if not, what other time in the next few weeks would be satisfactory to you.

Sincerely yours,

Clem

Clement L. Markert
Professor and Chairman

CLM/fd

LEHIGH UNIVERSITY
BETHLEHEM, PENNSYLVANIA, 18015

MARINE SCIENCE CENTER
WILLIAMS HALL

March 15, 1968

Dr. Maximo J. Cerame-Vivas, Director
Department of Marine Sciences
University of Puerto Rico
Mayaguez, Puerto Rico 00708

Dear Dr. Cerame-Vivas:

We are running our initial Workshop in Marine Science for 9 days during spring vacation, March 23-31, 1968, at the Bermuda Biological Station. Profs. Schopf, Herman, and myself are taking 8 graduate students this first time.

Before we submit a proposal to NSF for continuing this Workshop on an expanded scale, I want to consider the possibility of holding the Workshop during Christmas vacation, either the week preceding Christmas or the week following Christmas. At that time of year, Bermuda is not suitable for our purposes, so I would like to consider your Marine Station, and I feel I should see your facilities in person and discuss it with you. Would you be available any time between early April and mid-May for me to make a two-day visit to your station?

This one week Workshop is a first step towards a comprehensive Marine Science Option for graduate students that we are developing at Lehigh University, which may eventually involve an eight weeks course at a well-equipped marine station with adequate boats for short trips into deep water, and I would like to discuss this proposal with you also.

Very truly yours,

James M. Parks

James M. Parks, Director

JMP/k

CORNELL UNIVERSITY

ITHACA, N.Y. 14850

Vice President for Research
and Advanced Studies

15 March, 1968

Professor Maximo Cerame-Vivas
University of Puerto Rico
Mayagues, Puerto Rico

Dear Professor Cerame-Vivas:

Professor Mulligan of Cornell has told me of his interesting discussions with you. The fact that I am planning to be in LaParguera, staying at the Villa during the week of March 25, leads me to write you and suggest some further discussions.

As one of the trustees of Associated Universities Inc., I plan to visit the proposed site for the AUI-sponsored Tropical Marine Biology Station. Both from that standpoint and from my position at Cornell, I would very much like to talk with you on cooperative marine biology programs possibly involving AUI and, in the more near-term future, involving Cornell University. I would hope also to visit your station near LaParguera. I shall plan to get in touch with you sometime on the 25th or 26th and make plans for discussions and perhaps a visit.

Sincerely yours,

F. A. Long

FAL/db

UNIVERSITY OF MARYLAND
COLLEGE PARK 20740

COLLEGE OF AGRICULTURE
DEPARTMENT OF BOTANY

April 10, 1968

Dr. M. J. Cerame-Vivas, Head
Department of Marine Sciences
University of Puerto Rico
Mayaguez, Puerto Rico 00708

Dear Dr. Cerame-Vivas:

I want to take this opportunity to thank you again for the cordial cooperation I have received from your department, particularly from Dr. Luis Almodovar, in assisting us in our study of calcification on the reefs off the south coast of Puerto Rico. Without the splendid cooperation I have received the fruitful results of our study would not have been possible.

I should like to take this opportunity also to indicate the interest of this department in future cooperative arrangements with your department for the continuing study of problems in marine biology, particularly those dealing with the phytoplankton and the benthic marine algae. As you know, this department has a faculty of 28 and approximately 60 graduate students, many of whom are interested in marine biology, especially as it applies to plants of the sea. I would like the opportunity, at an early date, to explore with you the possibility of developing cooperative arrangements between our departments so that we might develop a program for both of our staffs that would accelerate the accumulation of knowledge in the area of tropical marine biology. I have discussed this matter with certain members of our Administration and they are receptive to the idea of exploring further with you a program of mutual benefit.

I think I should also say at this time that I feel congratulations are in order for the way in which you have moved forward since taking over the Chairmanship of your department. The staff that you have assembled is a distinguished one and I feel that in the years ahead you will be taking the necessary steps to strengthen and support the programs which are now underway in your department. Such a department is of great value to the University of Puerto Rico and to the Commonwealth at large and is in a position to achieve leadership in the area of tropical marine biology. Every effort should be made to support by facilities, and intellectual encouragement the group that you have with you. I would hope that any interactions between this institution and yours would serve that end.

When you are next in the Washington area perhaps you will be able to spend some time with us at the University of Maryland so that we can explore some of these matters further.

Sincerely,

Robert W. Krauss

Robert W. Krauss, Head and
Professor of Plant Physiology

RWK/hlk

Interchemical Foundation, Inc.

67 WEST FORTY-FOURTH STREET, NEW YORK, N. Y. 10036

July 1, 1968

Maximo J. Cerame-Vivas, Director
Department of Marine Sciences
University of Puerto Rico
Magaguez, Puerto Rico 00708

Dear Mr. Cerame-Vivas:

Dr. Russell N. Clark, Vice-President for Research and Development for Interchemical, has referred to us your letter of May 22nd requesting a scholarship to support the work of a graduate student in your department who is interested in invertebrate embriology.

We are pleased to advise you that the Foundation will grant the scholarship in the amount of $5,000 for the academic year commencing with your Fall semester for the purpose stated above. We cannot make any commitment beyond the 1968-69 academic year at this time, but will be pleased to consider such a request before the commencement of the 1969-70 academic year.

We would appreciate it if you would advise us when, and to whom we should send our check for $5,000.

Very truly yours,

Kenneth B. Lane

KBL:AQ

cc: Dr. R.N. Clark
Mr. G.E. Korradi

THE FLORIDA STATE UNIVERSITY

TALLAHASSEE 32306

DEPARTMENT OF BIOLOGICAL SCIENCE

November 14, 1968

Dr. Maximo Cerame-Vivas, Director
Department of Marine Sciences
University of Puerto Rico
Mayaguez, Puerto Rico 00708

Dear Dr. Cerame-Vivas:

Yesterday, Dr. Luis Almadovar visited me on his goodwill and information junket of various installations here in the United States. He indicated that you will be initiating a Ph.D. program by fall of 1969. First, congratulations, welcome to the club, and all that. I wish you the best of success and am anxious hereby to establish whatever cooperative arrangements are possible to help further both your interests and ours here in the development of marine science in the Caribbean area and in Latin America generally.

You may recall that I approached personnel at the Rio Piedras campus something over a year ago regarding establishment of cooperative efforts in the area of biological training at the graduate level. At that same time, I discussed in tentative terms such an arrangement with your installation there at Mayaguez. My intent at that time was to establish working relations between these two campuses via graduate student and/or faculty exchange as appropriate and pertinent to the research efforts of the two institutions. As an initial and tangible step toward this end, I offered to support two students with graduate assistantships, which students would be identified by the faculty of the University of Puerto Rico, and accordingly recommended to us. Nothing has happend thus far--now I am trying again.

Dr. Almadovar is familiar with the facilities and faculty of this institution as pertinent to marine science. If further information is desired, you have only to request it. I am here specifically repeating the offer as regards your campus for the support of graduate students for one or more years upon your recommendation. This is not an attempt to recruit your best students; it is instead an attempt to provide them with increased facility in the spectrum of marine science. I would expect the students you recommend to gain experience here in such areas as electron microscopy (we have a laboratory with 5 microscopes available to them); the flora and fauna of the gulf coast area in a comparative approach to that flora and fauna available in the Puerto Rican area; availability of graduate level courses in such specialties as comparative cellular physiology, neurophysiology as applicable to marine organisms; etc. I would expect the student to remain under the direction of your graduate committee there at the Mayaguez campus and to return to the University of Puerto Rico to complete his degree requirements, or if his research area is especially pertinent to

the activities and research in this Department, to have him complete his degree under our aegis here with faculty members from your Institution assigned to his graduate directive committee and for this purpose, given adjunct appointments in this Department and University.

I am further prepared to pay the salary of resident faculty here to spend the summer quarter and/or any quarter in the regular academic year on your campus in instructional capacity assuming only that they would also have time and opportunity to continue their research programs as they might mesh or interact with the research programs active there on your campus. I would, of course, expect reciprocity at both the graduate student and faculty level from your Institution as the cooperative situation develops.

We presently have one student from Puerto Rico, Mr. Frank Torres, who is in the advanced stages of earning his Ph.D. It may be possible to effect a specific cooperative effort in regard to this one student as an initial or opening venture.

May I please know your general reaction to this sort of a proposal in the near future. I would look forward to initiating activities by September 1969 if at all possible. Thanks in advance for your attention and cooperation.

Sincerely yours,

R. W. Hull
Chairman

RWH:brs

OCEAN DYNAMICS CORPORATION
OCEAN ENGINEERING - MANUFACTURING - EXPLORATION

TELEPHONE
(609) 964-2092

POINT AND ERIE STREETS
CAMDEN, NEW JERSEY 08102

December 13, 1968

Dr. Maximo Cerami
University of Puerto Rico
Mayaguez Campus
Mayaguez, Puerto Rico

Dear Dr. Cerami:

It was a pleasure talking to you recently; I must apologize for my two week delay in writing, however.

As I mentioned to you during our November 25th phone conversation, the Sea Grant Program Office of the National Science Foundation has an interest in an Industry - University team for promoting education in industrial and commercial applications of oceanography. During several of our meetings at NSF, this idea has been developed to the point of several possible team relationships. One very good possibility is the University of Puerto Rico together with Ocean Dynamics Corporation, Particularly in view of our interests and experience in the Caribbean Area.

With a modest effort, the idea could be developed into a proposal for a grant. As I mentioned, the Sea Grant Program Office is interested, and appears receptive for the 1969 and 1970 fiscal years.

We have written up a synopsis of such a proposal which may be interesting to you, and I am enclosing it with this letter.

Our Messers, Benjamin Fonorow and Robert Eichberg will be in Puerto Rico on other business this coming week and will call you for your comments while they are there. Of course, if you are stateside, I would be delighted to hear from you.

I shall look forward to hearing from you soon.

Cordially,

Elliot Rhian
President

ER/pd
enc.

THE VICE PRESIDENT
WASHINGTON

December 16, 1968

Dear Dr. Cerame-Vivas:

As this Administration draws to a close, I want to express my deep appreciation for your valuable contributions to the Marine Sciences Council.

In assisting President Johnson to advance our nation's marine affairs policy, I have been gratified to have your competence and interest.

I assure you that I will continue to be an enthusiastic advocate of a growing program in the days and years ahead to develop and use the resources of the oceans for the benefit of all men.

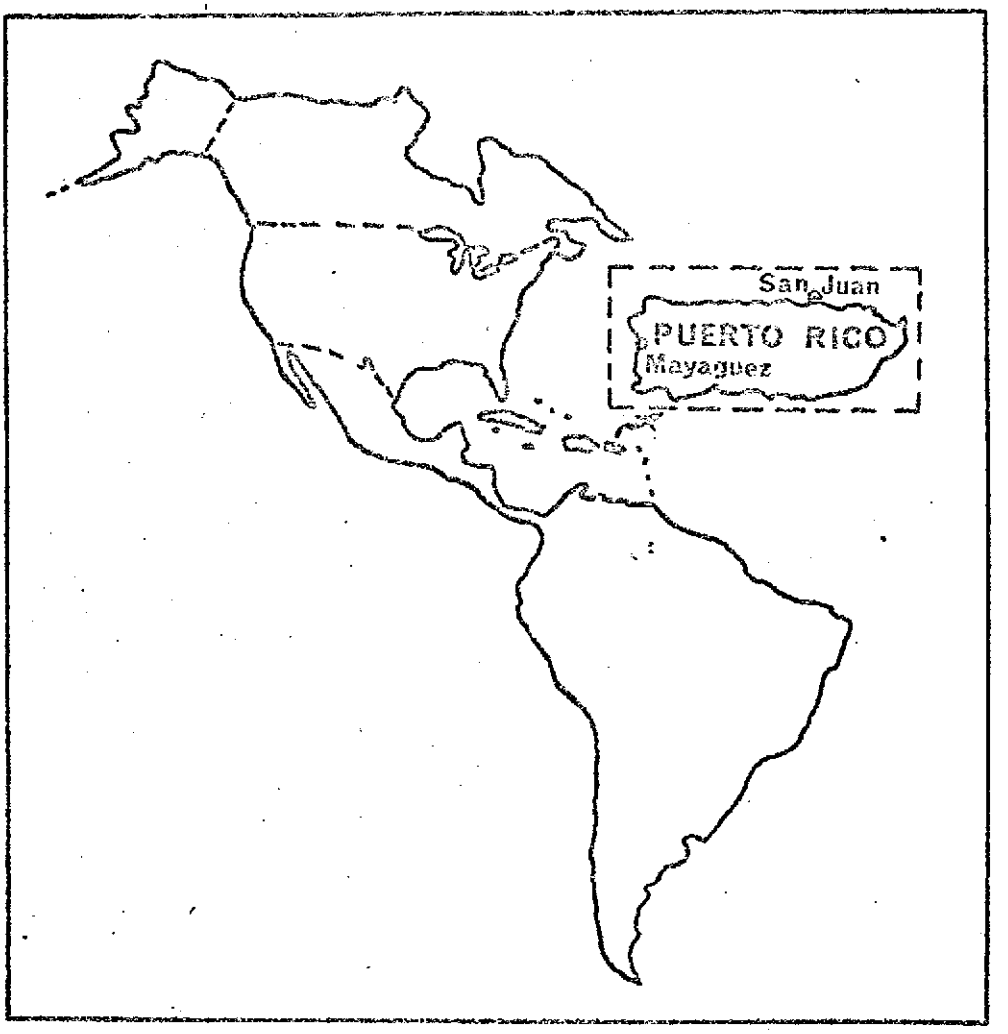
My very best wishes for a joyous Christmas and a most rewarding New Year.

Sincerely,

Hubert H. Humphrey

Dr. Maximo J. Cerame-Vivas
Director, Institute of Marine Biology
University of Puerto Rico
Commonwealth of Puerto Rico

PROSPECTUS FOR THE ESTABLISHMENT OF COOPERATIVE FISHERY & WILDLIFE UNITS IN THE COMMONWEALTH OF PUERTO RICO



ADMINISTRATIVE REPORT

UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

BUREAU OF SPORT FISHERIES AND WILDLIFE

Washington, D.C. March 1969

Apéndice 4

Normas de Estudios Graduados en el Recinto de Mayaguez

UNIVERSITY OF PUERTO RICO
Mayaguez, Puerto Rico

Graduate Studies

REGULATIONS

ORGANIZATION

Graduate instruction at the College of Agriculture and Mechanic Arts of the University of Puerto Rico is organized to provide opportunities and facilities for advanced study and research in the fields of Agriculture, Chemistry, Marine Sciences, Mathematics, Nuclear Science and Technology, and Radiological Physics. The purpose of these graduate programs is to develop in advanced students a more adequate comprehension of the scope of knowledge in these special fields of learning and an understanding of the requirements and responsibilities essential for independent research investigations. In all graduate programs emphasis is placed on a high level of scholarship rather than on the satisfaction of specific course or credit requirements.

FACILITIES

The full resources of the College of Agriculture and Mechanic Arts, including its academic divisions and departments, the Agricultural Experiment Station, the Nuclear Center, the Research Center, the Marine Station of the Department of Marine Sciences, and other dependencies, are available to all graduate students enrolled at this campus. This includes personnel, laboratories, equipment and other facilities needed for laboratory or field research. The high speed IBM computation system of the Computation Center and the X-Ray Diffraction and Spectographic Laboratory are also available for graduate instruction and research.

Library facilities, which include all the library resources of the University of Puerto Rico under a centralized system and a common card catalog currently being prepared, are also available.

ADMISSIONS

The applicant should obtain from the office of Graduate Studies the necessary forms on which to make his application. Transmission of these forms, together with three letters of recommendation from college faculty members who are acquainted with his academic qualifications, character and ability, and three official transcripts of all undergraduate and graduate work, normally completes an application for admission.

All credentials should be submitted to the office of Graduate Studies at least four weeks prior to the registration date for the semester or summer session which the applicant plans to attend. Applicants who have been away from school for several years may submit recommendations from persons acquainted with their work.

Admission to Graduate Studies is granted by the Graduate Council upon the recommendation of the Department concerned, and is based primarily on the applicant's undergraduate record. Candidates eligible for admission to Graduate Studies will be sent a permit to register, which will state the conditions under which he may enter. Transcripts of applicants who are admitted become a permanent part of the university files and cannot be returned.

Graduates of institutions other than the University of Puerto Rico will submit the credentials listed above and in addition may be asked to take placement examinations in their major field to determine the quality of their previous training and to guide their counselors in determining the courses best suited for their particular program.

Admission to Graduate Studies may be as follows:

A- Full graduate standing

The requirements for admission to this category are:

1. A degree equivalent to the bachelor's degree granted by the University of Puerto Rico in the proposed field of study.

2. A general grade index of 2.5 or better (on the basis of A= 4.00), or of 3.00 in the major field subjects.

B. Admission with deficiencies.

If the applicant possesses a bachelor's degree but does not fully meet requirement A-1 above, he may be considered for admission with deficiencies. Students admitted in this category must make up these deficiencies during the first year of graduate work and may be required to spend more time in residence than that normally required for the degree sought.

C. Admission on probation

In exceptional cases students whose records show an undergraduate greade-point average slightly below 2.5, but who meet all other requirements for

admission with full graduate standing, may be admitted on probation provide that other substantial evidence of scholastic aptitude and/or professional achievement are presented. A student who is admitted on probation must carry a full graduate program (12 to 15 credits for a normal semester or 3 to 6 credits for a summer session) during the first term of residence and must obtain an overall grade-index of 3.00 or better in order to be permitted to continue graduate studies.

D. Admission on Senior - Graduate basis

Seniors in the College of Agriculture and Mechanic Arts within 12 credits of graduation, who have earned a general grade-index of 3.00 or better and who can otherwise meet all requirements for admission to Graduate Studies with full standing, may be admitted under this category. The student may enroll for one semester in this status and may carry up to 6 credits of graduate work. He will receive graduate credit only if he completes the requirements for the bachelor's degree at the end of the semester during which he is so enrolled.

E. Unclassified

Under this category may be admitted candidates who otherwise qualify for admission but who do not seek a degree at the institution. The credits earned under this classification will not be counted toward residence.

GRADUATE GRADING SYSTEM

Unit of Instruction - One graduate credit consists of one hour of lecture discussion or two to four hours of laboratory or one to two hours of seminar or other work of similar nature per week during the semester.

Graduate Grades - The grades in graduate studies are as follows:
A- Excellent; B-Good; C-Satisfactory- D-Deficient (carries no graduate credit); F-Failure; W-Withdrawal; I- Incomplete; P. Passed.

Graduate Grade Index - The graduate grade index serves as a basis for measuring and evaluating the academic performance of the student. It is computed by dividing the total number of honor points earned by the total number of credits in graduate subjects in which the student received a final grade including the grade of F but not the grades of W and P. Honor points are assigned to each grade as follows: A:4, B:3, C:2, D:1, F:0.

The graduate grade index is considered satisfactory when it is 3.00 or above, which is equivalent to an average of B.

Graduate Course Numbering System - All graduate courses are designated by a three digit number according to the following system: 551-599 - courses for advanced undergraduate and graduate students; 600 up - courses for graduate students only.

ADMISSION TC CANDIDACY FCR GRADUATE DEGREE

Admission to a graduate program does not constitute or imply admission to candidacy for a graduate degree. Application for admission to candidacy for a graduate degree must be submitted to the Graduate Council after the satisfactory completion of one full semester of graduate study but before the end of the first nine weeks of the last semester in residence. Approval of the application will be based on the quality of the graduate work of the student as certified by the major department.

REQUIREMENTS FCR THE MASTER CF SCIENCE DEGREE

The Master of Science Degree is awarded by the College of Agriculture and Mechanic Arts of the University of Puerto Rico after satisfactory completion of the course work required of the student, demonstration of the ability to read a foreign modern language, completion of a satisfactory thesis, and the passing of a comprehensive final examination. In addition to these requirements, the candidate for the degree is expected to maintain a high level of scholarship. Graduate work is distinguished from undergraduate instruction by its emphasis on research. Training is provided to give the student familiarity with the methods, ideals and goals of independent investigation. The student's program of study is planned with these ideals in mind and the administration of his program is under the supervision of a special advisory committee. His course work and the thesis problem selected must be approved by this advisory committee and by the Graduate Council. The advisory committee will consist of at least three faculty members, appointed by the Graduate Council upon the recommendation of the Head of the major department. The advisory committee will meet with the student to prepare his program according to the student's graduate objectives. This program must be approved by the Director of the major department and the Graduate Council.

Hours of Credit - A minimum of thirty semester hours of credit in approved graduate courses is required for the Master's degree. Not more than six credit hours of "courses for advanced undergraduate and graduates" will be accepted toward the degree. At least fifteen credit hours shall be earned in the major subject and six credit hours shall be taken in graduate courses in related fields. At least 24 credit hours must be earned in graduate courses at the University of Puerto Rico (Mayaguez Campus). A maximum of six credit hours may be accepted from other graduate schools. Twelve to fifteen credit hours constitute a full load for graduate students. Under no circumstances shall a graduate student be permitted to carry a higher load.

Residence - Residence at the University of Puerto Rico (Mayaguez Campus) for at least one academic year as a regular graduate student is required for the Master of Science Degree. An academic year of residence is defined as registration for and attendance in graduate courses aggregating not less than twenty four credit hours distributed over a period of not less than two semesters. Three summer sessions of six week may be considered the equivalent of one semester.

Grade Index - A minimum grade index of 3.00 must be obtained in all graduate courses taken. Failure to obtain this average in any semester will automatically place the student on probation. No graduate credit will be earned in courses approved with a grade of C in excess of six credits. Courses passed with a grade lower than C carry no graduate credit.

Language Requirements - A reading knowledge of a modern foreign language is required of candidates for a Master of Science degree. The specific language requirements are established by the different departments and programs. Knowledge is determined by the language departments on the basis of a reading examination given in cooperation with the student's major department on dates set forth and scheduled by the language departments. Students whose knowledge of the language is not adequate should confer with the directors of the language departments to formulate plans for meeting this requirements for the degree.

THESIS REQUIREMENT

All candidates for the Master of Science degree must present a thesis representing investigation or research. The subject of the thesis must be approved by the director of the student's major department and by the student's advisory committee. Three copies of the thesis in final form and three copies of the abstract must be filed in the office of the Graduate Council at least one week before the final examination. Detailed instructions as to the form and organization of the thesis may be obtained from the academic departments.

Examination Requirements - Requirements for a Master of Science degree are not measured solely in terms of accumulated credits. Each candidate must pass a final oral examination covering the general field of his major study, courses in related fields and his thesis. This examination cannot be held until all requirements are satisfied with the exception of the course work in progress. The examination will be conducted by the student's graduate advisory committee and a representative from the Graduate Council at a date set forth by them. The date of the examination will be announced publicly, and members of the University faculty may attend. In special cases, a written examination may be substituted for the oral examination. In case of failure the candidate may not appear for re-examination until one semester has elapsed. The result of the second examination is final.

WITHDRAWALS AND DISMISSALS

A student will not be elegible for candidacy for the Master of Science degree and will be permanently suspended from Graduate Studies in the following cases:

1) If he receives a grade of C or lower in ten or more credits of graduate courses in his program of study.

2) If he receives a grade of D in any two graduate courses, or in one course in his major field.

3) If he receives a grade of F in any graduate course in his program of study.

4) If he fails the second time he takes a final examination.

5) If he fails to pass the foreign language proficiency test for the third time.

5) If he fails to fulfill all the requirements for graduation within six calendar years from the date of his admission to the Graduate School.

7) In any other circumstance specifically indicated by the Department in which the student is enrolled.

A graduate student should avoid as much as possible the dropping of courses. Nevertheless, he will be permitted to do so with the approval of his advisor. Except in case of illnes, certified by a competent physician, no student will be allowed to drop courses during the last eight weeks of a regular semester. An unauthorized withdrawal will impose the grade of F. A student who drops all courses will automatically be withdrawn from graduate Studies. Any student permanently suspended or who has withdrawn from Graduate Studies must apply fro readmission if he intends to continue graduate work.

Apéndice 5

Curriculum Vitae de la Facultad de Ciencias Marinas

Name: Luis R. Almodóvar

Citizenship: U.S.A.

Date and Place of Birth: January 19, 1931-San Germán, Puerto Rico

Education:

B. A. 1950-, Polytechnic Institute of Puerto Rico
M. S. 1955-, Florida State University-Tallahassee, Florida
Ph.D. 1953-, Florida State University-Tallahassee, Florida
Thesis: The Fresh-water and Terrestrial Cyanophyta of Dr. Harold H. Humm and Dr. Chester S. Nielsen, Museum work at the Chicago Natural History Museum was supervised by Dr. Francis Drouet (1956-1957).

Experience:

High School Teacher-, Fajardo High School, Puerto Rico-1950-1951.
U. S. Marine Corps-, 2nd. Marine Division-, 1951-1953.
U. S. Marine Corps Reserve-, 1953-1959.
Graduate Assistant-, Oceanographic Institute, Florida State University 1953-1954.
Graduate Teaching Assistant, Dept. of Biological Sciences, Florida State University-, 1955-1957.
Instructor-, Institute of Marine Biology, University of Puerto Rico-1957-1960.
Assistant Professor-, Institute of Marine Biology, University of Puerto Rico-, 1960-1964.
Associate Professor-, Institute of Marine Biology, University of Puerto Rico-, 1964-1969.
Professor-, 1969.

Professional and Honorary Societies:

Phi Sigma
Sigma Xi
Tri Beta
Association of Island Marine Laboratories
Torrey Botanical Club
Botanical Society of America
Florida Academy of Science
Phycological Society of America
International Phycological Society
International Association of Plant Taxonomists
New York Academy of Sciences
British Phycological Society

Fellowships Awarded:

1. A.A.A.G. Grant-in-Aid, Florida Academy of Sciences, 1953.
2. Graduate Fellow, Florida State University, Summers 1955-1956.
3. University of Puerto Rico Fellowships, 1957-1958.
4. American Academy of Arts and Sciences Grant-in-Aid, 1961.
5. John Simon Guggenheim Foundation Fellow, 1959.

Publications:

Almodóvar, Luis R. and Hugo L. Blomquist. 1959. The benthic algae of Bahía Fosforecente, Puerto Rico. Journal of the Florida Academy of Sciences. 2(3): 153-163.

Burkholder, Paul R., Lilliam Burkholder, and Luis R. Almodóvar. 1960. Antibiotic activity of some marine algae of Puerto Rico. Botánica Marina 2(1-2): 149-156.

Blomquist, Hugo L., and Luis R. Almodóvar. 1961. The occurence of Galidiella tenuissima Feld. et Hamel in Puerto Rico. Nova Hedwigia 3(1): 67-69.

Almodóvar, Luis R., and Hugo L. Blomquist. 1961. Notes on the algae from Cabo Rojo, Puerto Rico. Journal of the Florida Academy of Sciences. 24(2): 81-93.

Almodóvar, Luis R. and R. Biebl. 1962. Osmotic resistance of mangrove algae around La Parguera, Puerto Rico. Revue Algologique 6 (3): 203-208.

Almodóvar, Luis R. 1962. The fresh-water and terrestrial Cyanophyta of Puerto Rico. Nova Hedwigia 5 (1-4): 429-435.

Almodóvar, Luis R. 1962. Notes on the algae of the coral reefs off La Parguera, Puerto Rico, Journal of the Florida Academy of Science 25 (4): 275-286.

Warmke, Germaine L. and Luis R. Almodóvar. 1963. Some associations of marine mollusks and algae in Puerto Rico. Malacologia 1 (2): 153-177.

Almodóvar, Luis R. 1964. Ecological aspects of some antibiotic algae from Puerto Rico. Botánica Marina 6 (1-2): 143-146.

Almodóvar, Luis R. 1964. The marine algae of Bahía de Jobos, Puerto Rico. Nova Hedwigia 7 (1-2): 33-52.

Almodóvar, Luis R. 1964. The marine algae of Guanica, Puerto Rico. Revue Algologique 7 (2): 129-150.

Almodóvar, Luis R. 1964. Observations on the deep-water algae off La Parguera, Puerto Rico. American Journal of Botany. 51 (5): 632.

Olesen, Paul, Andi Maretzki, and Luis R. Almodóvar. 1964. An investigation of antimicrobial substances from marine algae. Botánica Marina 5 (3): 224-232.

Glynn, Peter, W., Luis R. Almodóvar, and Juan G. González. 1964. Effects of hurricane Edith on marine life in La Parguera. Caribbean Journal of Science. 4 (2-3): 335-345.

Almodóvar, Luis R. and Hugo L. Blomquist. 1965. Some marine algae new to Puerto Rico. Nova Hedwigia. 9 (1-4): 53-71.

Almodóvar, Luis R. 1965. The un-named Rhodophyta of the Marshall A. Howe collection of marine algae from Puerto Rico. Nova Hedwigia. 9 (1-4): 1-19.

Boyd, William C., Luis R. Almodóvar and Lyle G. Boyd. 1965. Agglutinins in marine algae. Transfusion 6 (1): 32-33.

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Almodóvar, Luis R. and F. Pagan. 1967. Notes on the algae of Barbados. Nova Hedwigia. 13 (1-2): 111-115.

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Schwartz, Sheila L. and Luis R. Almodóvar. 1968. Heat tolerance of reef algae at La Parguera, Puerto Rico. Nova Hedwigia (In Press).

Stark, Lilliam, Luis R. Almodóvar, and Robert W. Krauss. 1969. Factors affecting the rate of calcification in Halimeda opuntia (L). Lamouroux and Halimeda discoidea Decaisne. Journal of Phycology (In Press.)

Almodóvar, Luis R. 1969. Deep water algae new from Puerto Rico. Journal of the Florida Academy of Sciences (In Press).

Almodóvar, Luis R. and F. Pagán. 1969. Notes on a mangrove lagoon and mangrove channels at La Parguera, Puerto Rico. Nova Hedwigia In Press).

Almodóvar, Luis R. and Andrew Rehm. 1969. Marine algal balls at La Parguera, Puerto Rico. Nova Hedwigia (In Press).

Rehm, Andrew and Luis R. Almodóvar. 1969. The zonation of Caulerpa racemosa (Forsskal) J. Agarth at La Parguera, Puerto Rico. Revue Algologique (in press).

Edgington, David, Solon A. Gordon, Michael A. Thommes, and Luis R. Almodóvar. The concentration of Radium, Thorium, and Uranium by tropical marine algae (Plant Physiology - in press).

Research Grants Received:

1960-1962 National Science Foundation 14020. The Marine algae of the mangrove of Puerto Rico. 2 years - $12,000.00

1962-1964 National Science Foundation Grant 25131. The taxonomy of the marine algae of the mangrove of P.R. 2 years - $14,000.00

1964-1965 National Science Foundation Grant GB 2151. An ecological study of the marine algae of the mangroves of Puerto Rico. 2 years - $12,400.00

1966-1968 National Science Foundation Grant GB 5936. An ecological study of the marine algae of the mangroves of Puerto Rico. 2 years - $16,500.00

1966-1969 Office of Naval Research Grant N-00014-66-C-0330. Ecology of the deep-water algae off La Parguera, Puerto Rico. 3 years - $34,034.36.

1969-1971 National Science Foundation Grant GB-11740. An ecological study of the marine algae of the mangrove root community in Puerto Rico. 2 years - $17,700.00

Total Amount Received to 2 October 1969. $105,334.36

Papers Presented at Meetings:

23th Annual Meeting of the Florida Academy of Sciences March 19-21, 1954. Paper titled " Notes on the deep water algae from La Parguera, Puerto Rico".

15th Annual Meeting of the A.I.B.S. on August 23-28, 1954 at the University of Colorado, Boulder, Colorado. Paper titled "Observations on the deep-water algae off La Parguera, Puerto Rico".

29th Annual Meeting of the Florida Academy of Sciences - March 11-13, 1955, Paper titled " The marine algae of the Rhizophora channels at La Parguera, Puerto Rico.

Thesis Supervised:

Pagán Font, Francisco A. 1957. A Study of the Commercial Relationship Between the Conch Fish Astrapogon stellatus (Cope) and the Queen Conch, Strombus gigas Linnaeus in South Western Puerto Rico

Blasini de Austin, Sheila. 1963. Ecological Studies on Three Species of the West Indian Intertidal Snails Neritidae: Zonation and Feeding.

Rehm, Andrew E. 1969. The Biology of Caulerpa racemosa (Forsskal) J. Agardh in Puerto Rico.

Graduate Students Supervised at Present: (Chairman)

Edith Montalvo de Ramirez
Evelina Alexander

Member of other Graduate Student Committies:

José González Liboy
Michael Bradley

Nombre: William D. Athearn

Fecha y lugar de nacimiento: 29 de abril de 1925, Fall River, Massachusetts

Educación:

B. Sc. University of Massachusetts, 1950
1 year Graduate Study in Oceanography & Marine Geology, Harvard University, 1950-51

Experiencia profesional:

1951-1955 Auxiliar de Investigación, Woods Hole Oceanographic Institution
1955-1967 Asociado de Investigación, Woods Hole Oceanographic Institution
1968 Asociado de Investigación en Geología Marina, Universidad de Puerto Rico, Mayaguez, P. R.

Sociedades a que pertenece:

1950 Phi Kappa Phi
U. S. Naval Institute

Publicaciones:

Athearn, W. D. (1957) Comparison of clay from the continental shelf off Long Island with the Gardiners clay: J. Geology, 65(4):448-449

Zeigler, J. M., Athearn, W. D. & Small, H. (1957) Profiles across the Perú-Chile Trench: Deep-Sea Research, 4:238-249.

Parker, F. L. & Athearn, W. D. (1959) Ecology of marsh Foraminifera in Poponesset Bay, Massachusetts: J. Paleontology, 33(2): 333-343.

Athearn, W. D. (1959) Sediments of the Caricco Trench: International Oceanographic Congress Preprints, A. A. A. S., pp. 594-595. (abs.)

_____ (1963) Bathymetry of the Straits of Florida and the Bahama Islands, Part II, Bathymetry of the Tongue of the Ocean, Bahamas: Bull. of Marine Science of the Gulf and Caribbean, 13(3): 365-377.

_____ & Ronne, C. (1963). Shoreline changes at Cape Hatteras: An Aerial photographic study of a 17-year period: Naval Research Reviews, 16(6): 17-24.

Athearn, W. D. (1967) Estimation of relative grain size from sediment clouds: in DEEP-SEA PHOTOGRAPHY, Chap. 16, Johns Hopkins Press.:

Athearn, W. D. (In press) Upper Slope Bathymetry off Guayanilla and Ponce, Puerto Rico: Proc. 5th Caribbean Geological Conference.

Reportes:

Athearn, W. D. (1954) Bottom Sediments and Foraminifera from Labrador: BLUE DOLPHIN 1951 and 1952: Woods Hole Oceanographic Institution (W.H. O.I.), Ref. No. 54-42, 17 pp.

Athearn, W. D. (1957) Final Report. Ecologic information on living Foraminifera of the Gulf of Mexico and the Caribbean Sea: W.H.O.I. Blue Cover Rpt., no ref. no., 121 pp.

_____(1962) Bathymetric and sediment survey of the Tongue of the Ocean, Bahamas. Part I: Bathymetry and sediments: W. H. O. I. Ref. No. 62-25, 21 pp., 4 charts.

Athearn, W. D. & Owen, D. M. (1962) Bathymetric and sediment survey of the Tongue of the Ocean, Bahamas. Part II: Bottom photographs: W. H. O. I. Ref. No. 62-27, 5 pp., 27 photos.

Athearn, W. D. (1965) Sediment cores from the Caricco Trench, Venezuela: W. H. O. I. Ref. No. 65-37, 20 pp. (also in press of Proc. 4th Caribbean Geological Conference).

Zeigler, J. M. & Athearn, W.D. (1965) The hydrography and sediments of the Gulf Darien: W. H. O. I. Ref. No. 65-29, 6 pp. (also in press of Proc. 4th Caribbean Geological Conference).

Name: Donald K. Atwood

Citizenship: U.S.A.

Date and Place of Birth: June 5, 1933, Burlington, Vermont

Education:

B. S., 1955, St. Michael's College, Vermont, Chemistry
Ph.D. 1960, Purdue University, W. Lafayette, Ind. Inorganic Chemistry.

Experience

Graduate Teaching Assistant, Purdue University, 1955-1957.
Graduate Assistant (Research), Purdue University, 1957-1960.
Research Engineer, 1960-1963, Humble Oil & Refining Co., Houston, Texas.
Senior Research Chemist, 1963-1965, Hemble Oil & Refinery Co, Houston, Texas.
Senior Research Chemist, 1965-1967, Esso Production Research Co., Houston, Texas.
Senior Research Specialist, 1967-1969, Esso Production Research Co, Houston Texas.
Associate Professor Chemical Oceanography, Department of Marine Science, University of Puerto Rico, 1969-

Professional and Honorary Societies

Phi Lambda Upsilon (Chemist Honorary)
Delta Epsilon Sigma (Catholic Scholastic Sigma Xi.
Alpha Chi Sigma (Chemists Society)
American Chemical Society
American Association for Advancement of Science
Clay Minerals Society
Geochemical Society

Publications

Ph.D. Thesis

A Study of Ruthenium (III) Ruthenium (IV) Species in Acueous Solution; Purdue University, August, 1960.

Publications from Thesis.

Transformation of Polymeric Ruthenium (IV) to the Monomeric Species on Ion Exchange Resin, by Donald K. Atwood and Thomas DeVries, Journal American Chemical Society, Vol. 83, 1509 (1961).

The Electrode Potential of Ruthenium (IV) and Its Lower Oxidation States, by Donald K. Atwood and Thomas DeVries, Journal American Chemical Society, Vol. 84, 2659 (1962).

Publications with Esso

Restoration of Permeability to Water Damaged Cores by D.K. Atwood, Petroleum Transactions, December 1964, Page 1405.

Compositional Variations of Some West Texas Middle Silurian Dolomites by D. K. Atwood and J. N. Bubb. Presented at South Central Regional G. S. A., Meeting at U. of Oklahoma on March 31, 1967.

Separation of Fine Grained Recent Dolomites by R.S. Barbcock, D. K. Atwood and D. Perry. American Mineralogist, Vol. 52, Sept. - Oct. 1967, pg. 1563.

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An Example of Modern Secondary Reflux Dolomitization- Inagua, Bahamas by J. N. Bubb and D. K. Atwood. Presented at SEPM meeting, Oklahoma City, April 22, 25, 1968.

Recent Dolomite Distribution, Sugarloaf Key, Fla.by D.K. Atwood and J. N. Bubb. Presented at Geological Society of America Meeting, Mexico City, November, 1968.

Name: Paul R. Burkholder

Date and place of birth: February 1, 1903, Orrstown, Pennsylvania

Citizenship: United States

Education:

Dickinson College, A.B., 1924
Cornell University, Ph.D., 1929
National Research Council Fellow, Harvard, 1932-1933
National Research Council Fellow, Columbia, 1933-1934
Yale University, Honorary M.A., 1944
Dickinson College, Sc. D., 1949

Experience:

1924-1928	Instructor in Botany, Cornell
1929-1932	Curator of Biology, Buffalo Museum
1932-1933	National Research Council Fellow in Botany, Harvard
1933-1934	National Research Council Fellow in Botany, Columbia
1934-1937	Assistant Professor, Connecticut College
1937-1938	Associate Professor, Connecticut College
1938-1940	Associate Professor, University of Missouri
1940-1944	Associate Professor, Yale University
1944-1953	Professor, Yale (Department Head, 1951-1953)
1953-1955	Professor of Microbiology & Head of Department of Microbiology, University of Georgia
1955-1961	Director of Research, Brooklyn Botanic Garden
1961-1969	Chairman of Biology Programs, Lamont Geological Observatory of Columbia University

Listed in Who's Who in America and in American Men of Science

1969	Professor of Marine Microbiology, Department of Marine Sciences, University of P.R., Mayaguez

Societies:

National Academy of Sciences (U.S.A.)
American Association for the Advancement of Science
Botany Society of America
American Society for Microbiology
Torrey Botanical Club
American Society of Plant Physiologists
Society of General Microbiology (British)
Honorary Member, Argentine Society of Microbiology

Canadian Society of Microbiology
Society of Limnology and Oceanography
American Academy of Oceanography

Publications:

1930 Microplankton Studies of Lake Erie. Bull. Buffalo Soc. Nat. Sci. 14: 73-93.

1930 The Heredity and Environment Exhibit. Hobbies. The Magazine of the Buffalo Museum of Science.

1931 Studies in the Phytoplankton of the Cayuga Lake Basin, New York. Bull. Buffalo Soc. Nat'l Sci. Vol. 15, No. 2, p. 181.

1931 Plankton Studies in Some Northern New York Waters. New York Conserv. Dept. Suppl. Ann. Report (with W.L. Tressler).

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1933 The Effect of pH upon Movement in Oscillatoria. Jour. Gen. Physiol 16: 875-881.

1934 Movement in the Cyanophyceae. Quart. Rev. Biol. 9: 438-459.

1936 Leaf-Movement of Mimosa Pudica in Relation to Light. Amer. Jour. Bot. 23: 46-52 (with R. Pratt).

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1936 Polarized Growth and Cell Studies on the Avena Coleoptile, Phyto-hormone Test Object. Bull. Torrey Bot. Club 63: 1-15 (with G.S. Avery).

1936 Growth Hormones in Plants. McGraw Hill, N.Y. 268 pp. (co-author with Boysen-Jensen and Avery).

1936 Plant Hormones and Mineral Nutrition. Proc. Nat. Acad. Sci. 22: 673-678 (with G.S. Avery and H.B. Creighton).

1937 Inactivation of Plant Growth Substance by Light. Smithsonian Miscell. Coll. 95(20): 1-14 (with E. S. Johnston).

1937 Avena Coleoptile Curvature in Relation to Different Concentrations of Certain Synthetic Substances. Amer. Jour. of Botany. Vo. 24, No. 4, 226-232 (with G.S. Avery, Jr. & Harriet B. Creighton).

1937 Nutrient Deficiencies and Growth Hormone Concentration in Helianthus and Nicotiana. Amer. Jour. Bot. 24: 553-557 (with G.S. Avery & H.B. Creighton).

1937 Growth Hormone in Terminal Shoots of Nicotiana in Relation to Light. Amer. Jour. Bot. 24: 666-673 (with G.S. Avery and H.B. Creighton).

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1937 Polarized Growth and Cell Studies in the First Internode and Coleoptile of Avena in Relation to Light and Darkness. Bot. Gazette, Vol. XCIX, No. 1 (with G.S. Avery & H.B. Creighton).

1938 Darwin and Early Discoveries in Connection with Plant Hormones. Science, Vol. 87 (2247): 56 (with G.S. Avery, Jr., H.B. Creighton & B.A. Scheer).

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1940 Growth and Differentiation of Maize in Relation to Nitrogen Supply. Amer. Jour. of Bot. Vol. 27: No. 6: 414-424 (with Ilda McVeigh).

1940 Growth of Phycomyces Blakesleeanus in Relation to Varied Environmental Conditions. Amer. Jour. of Bot. Vol. 27, No. 3: 634-640 (with Ilda McVeigh).

1940 Studies on Thiamin in Green Plants with the Phycomyces Assay Method. Amer. Jour. of Bot. Vol. 27, No. 10: 853-861 (with Ilda McVeigh).

1941 Multinucleate Plant Cells. Bull. of the Tor. Bot. Club, Vol. 68, No. 6: 395-396 (with Ilda McVeigh).

1941 Calcium Deficiency as A. Factor of Abnormal Rooting of Philodendron Cuttings. Phytopathology, Vol. XXXI, No. 9: 844-848 (with C.M. Tucker).

1941 Some Experiments with Growth Curvatures and Growth Substances. Amer. Jour. of Bot. Vol. 28, No. 10: 911-921.

1942 Pyridoxine as a Growth Factor for Graphium. Sci. Vol. 95. No. 2457: 127-128.

1942 Thiamine in Some Common American Trees. Bull. of Tor. Bot. Club. 69 (6): 421-428 (with A.G. Snow, Jr.).

1942 Synthesis of Vitamins by Intestinal Bacteria. Proc. of the Nat'l Academy of Sciences, Vol. 28, No. : 285-289.

1942 The increase of B vitamins in Germinating Seeds. Proc. of the Nat'l Acad. of Sci. Vol. 28, No. 10: 440-446 (with Ilda McVeigh).

1943 Vitamin Deficiencies in Yeasts. Amer. Jour. of Bot. Vol. 30, No. 3: 206-211.

1943 Vitamins in Dehydrated Seeds and Sprouts. Sci. Vol. 97, No. 2529: 562-64.

1943 Synthesis of Riboflavin in a Yeast. Proc. of the Nat'l Acad. of Sci. Vol. 29, No. 6: 166-172.

1943 Vitamin Deficiencies of Fifty Yeasts and Molds. Bul. of Tor. Bot. Club. Vol. 70, No. 4: 372-377 (with Dorothy Moyer).

1943 Vitamins in Edible Soybeans. Sci. Vol. 98, No. 2539: 188-190.

1943 New Vitamin Sources - Research Discovers Plentiful Supplies in Beans and Yeasts. Yale Scientific Magazine. Vol. XVIII, No. 1.

1943 Influence of Some Environmental Factors Upon the Productions of Riboflavin by a Yeast. Arch. of Bioch. Vol. 3, No. 1.

1943 Synthesis of Vitamins by Micro-organisms in Relation to Vitamin Content of Fancy Cheeses. Food Res. Vol. 8, No. 4: 314-322 (with Jane Collier & Dorothy Moyer).

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1944 Antibiotic Activity of Lichens. Proc. of the Nat'l Acad. of Sci. Vol. 30, No. 9: 250-255 (with Alexander W. Evans, Ilda McVeigh & Helen K. Thornton -Osborn Bot. Lab.).

1944 Some Growth Patterns of Bacteria in Cylinder Plate Tests for Promotion and Inhibiting Substances. Amer. Jour. of Bot. Vol. 31, No. 9: 555-558.

1944 Studies on Some Growth Factors of Yeasts. Vol. 48, No. 4, Jour. of Bact.: 385-391 (with Ilda McVeigh & Dorothy Moyer).

1945 Further Studies on the Antibiotic Activity of Lichens. Bull. Tor. Bot. Club. Vol. 72, No. 2: 157-164 (with Alexander W. Evans).

1945 Morphogenesis of Fungus Colonies in Submerged Shaken Cultures. Amer. Jour. of Bot. Vol. 32, No. 7: 424-431 (with Edmund W. Sinnott).

1945 Studies on Vitamin B Produced by Micro-organisms. Arch. of Biochemistry. Vol. 7, No. 2 (with Ilda McVeigh & Katherine Wilson).

1945 Vitamin Content of Some Mature and Germinated Legume Seeds. Plant Physiol. Vol. 20, No. 2: 301-306 (with Ilda McVeigh).

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1947 Induced Biochemical Mutation in Bacillus subtilis. Amer. J. of Bot. Vol. 34, No. 6: 345-348 (with Norman H. Giles, Jr.).

1947 Inhibition of Azotobacter by Soil Actinomycetes. Jour. of Amer. Soc. of Agronomy. Vol. 39, No. 9 (with L.G. Nickel).

1947 Chloromycetin, a New Antibiotic from a Soil Actinomycete. Sci. Vol. 106, No. 2757.

1943 Streptomyces Venezuelae, N. Sp. the Source of Chloromycetin. Jour. of Bact. Vol. 56, No. 4 (with John Ehrlich, David Gottlieb, Lucia E. Anderson & T. G. Pridham).

1948 Influence of Amino Acids on Growth of Datura Embryos in Culture. Proc. of the Nat'l Acad. of Sci. Vol. 34, No. 11: 516-526 (with Mary E. Sanders).

1949 A typical Growth of Plants I. Cultivation of Virus Tumors of Rumex on Nutrient Agar. The Bot. Gazette. Vol. 110. No. 3 (with L. G. Nickell).

1949 Studies on the Biochemical Genetics of Yeast. Proc. of the Nat'l Acad. of Sci. Vol. 35, No. 8: 456-464 (with Seymour Pomper).

1949 Specificity of Microbiological Attack on Cellulose Derivatives. Textile Res. Jour. Vol. XIX, No. 3 (with R. G. H. Siu, Richard T. Darby & E. S. Barghoorn).

1949 Antibiotics - Chemical Opponents of Disease. Yale Sci. Mag.

1950 A Typical Growth of Plants II. Growth in Vitro of Virus Tumors of Rumex in Relation to Temperature, pH and Various Sources of Nitrogen, Carbon and Sulfur. Amer. Jour. of Bot. Vol. 37, No. 7: 533-547 (with L. G. Nickell).

1950 A Typical Growth of Plants III. Growth Responses of Virus Tumors of Rumex to Certain Nucleic Acid Components and Related Compounds. The Bot. Gaz. Vol. 113, No. 1 (with L. G. Nickell and P. Greenfield).

1950 The Antibiotic Age of Chemotherapy. M. D. Vol. 5, No. 7.

1951 Determination of Vitamin B-12 with a Mutant Strain of E. coli. Science, Vol. 114, No. 2966: 459-460.

1952 Microbiological Studies on Materials with Potentiate Oral Vitamin B-12 Therapy in Addisonian anemia. Arch. of Biochem. and Biophys. Vol. 39, No. 2.

1952 Cooperation and Conflict Among Primitive organisms. Amer. Scientist. Vol. 40, No. 4.

1954 Speciation and Variation in Asexual Fungi. Annals of the N. Y. Acad. of Sci. Vol. 60, Art. 1: pp1-132 (PRB and others).

1954 Criteria of Speciation in the Genus Streptomyces. Annals of the N.Y. Acad. of Sci. Vol. 60, Art. 1: 102-123 (with Sung Huang Sun, John Ehrlich and Lucia Anderson).

1954 The Spirit of Science. Georgia Review, Vol. VIII, No. 4.

1955 The Identity of Viomycin - Producing cultures of Streptomyces. Bull. of Tor. Bot. Club, Vol. 82, No. 2: 108-117 (with Sung Huang Sun, Lucia E. Anderson & John Ehrlich).

1955 The University and Research. The Georgia Allumni Record.

1955 Biological Adaptation, Dept. of Bact., Univ. of Georgia.

1955 Culture Collection of Algae. Dept. of Bact., U. of Georgia, Athens, Ga.

1956 Strains of Streptomyces, The Sources of Azaserine, Elaiomycin, Griseoviridin, and Viridogrisein. Antibiotics and Chemotherapy. Vol. VI, No. 2 (with Lucia E. Anderson, John Ehrlich, & Sung Huang Sun).

1956 Microbiological Assay of B-12 in Marine Solids. Sci. Vol. 123, No. 3207: 1071-1073 (with Lillian M. Burkholder).

1956 Vitamin B-12 in Suspended Solids and Marsh Muds Collected Along the Coast of Georgia. Limnology and Oceanography. Vol. 1, No. 3: 202-208 (with Lillian M. Burkholder).

1956 Studies on the Nutritive Value of Spartina Grass Growing in the Marsh Areas of Coastal Georgia. Bull. of the Tor. Bot. Club, Vol. 83, No. 5: 327-334.

1952 Biological Engineering. Yale Scientific Magazine.

1957 Decomposition of Marsh Grass by Aerobic Marine Bacteria. Bull. of the Tor. Bot. Club, Vol. 84, No. 5: 366-383 (with George H. Bornside).

1958 Antimicrobial Activity of Horny Corals. Science, Vol. 127, No. 3307: 1174-1175 (with Lillian M. Burkholder, Brooklyn Botanic Garden and Inst. of Marine Biology, University of Puerto Rico).

1958 Studies on B Vitamins in Relation to Productivity of the Bahía Fosforescente, Puerto Rico. Bull. Marine Sci. Gulf and Caribbean. Vol. 8 (3): 201-223.

1959 Some Chemical Constitutents of Turtle Grass, Thalassia testudinum. Bull. of the Tor. Bot. Club, Vol. 86: 88-93 (with Lillian M. Burkholder, Juan A. Rivero, Inst. of Marine Biol., Univ. of Puerto Rico.).

1959 Chlorophyll A in Some Corals and Marine Plants. Nature, Vol. 183: 1338-1339 (with L.M. Burkholder, Brooklyn Bot. Garden, & J.A. Rivero, Inst. of Marine Biol., U. of Puertb Rico.).

1959 Organic Nutrition of Some Mosses Growing in Pure Culture. The Bryologist, Vol. 62, No. 1: 6-15.

1959 Antibiotics - Miracle Drugs Have a Challenging Impact on Medicine and Society. Science, Vol. 129, No. 3361: 1457-1465.

1959 Production of B Vitamins by Bacteria of the Sea. Presented at International Oceanographic Congress, New York, 1959.

1959 Measurements of Productivity of Turtle Grass Flats, Reefs, and the Bahia Fosforescente of Southern Puerto Rico. Inst. of Marine Sci., U. of Texas, Port Aransas, Texas, Inst. of Marine Sci. VI: 159-170 (with Howard T. Odum).

1960 Distribution of Some Chemical Values in Lake Erie. Limnological Survey of Eastern and Central Lake Erie, 1928-29. Special Scientific Rept., Fisheries, No. 334, June, 1960, pp. 71-110.

1960 A Survey of the Microplankton of Lake Erie. Limnol. Survey of Eastern and Central Lake Erie, 1928-29. Special Scientific Rept. Fisheries, No. 334, June 1960, pp. 123-144.

1960 Antibiotic Activity of Some Marine Algae of P.R. (with L.M. Burkholder, Brooklyn Botanic Grdn. and Luis R. Almodóvar, Inst. of Marine Biol., U. of P.R.) Botanica Marina, 11, 10/1960.

1960 General Microbiology of Antarctic. In - Science in Antarctica Part I: The Life Sciences in Antarctica - Publ. 839, pp. 129-137. Nat. Acad. of Science - Nat. Res. Council.

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1960 Photosynthesis in some Alcynacean Corals. Amer. J. Bot. 47 (10): 866-872 Illus. (with L.M. Burkholder).

1961 Phytoplankton and chlorophyll in the Gerlache and Bransfield Straits of Antarctica (with E. F. Mandelli) Limnol. and Oceanogr. 6, 1, Jan. '61.

1963 Some nutritional relationships among microbes of sea sediments and waters. In Symposium on Marine Microbiology, pp. 138-150. C. C. Thomas, Springfield, Ill.

1963 Radioactivity in Some Antarctic Areas. Nature, 197, No. 4865, May, 1963, pp. 621-623.

1963 Drugs from the Sea. Armed Forces Chemical J. March, 1963.

1965 Estudio de los Liquenes de Tierra del Fuego con especial consideración de su actividad antibiótica. (with C. W. Dodge and L. M. Burkholder) Centro de Invest. de Biol. Marina - Cont. Científica No. 21, 1-24.

1965 Numerical Taxonomy of Some Bacteria Isolated from Antarctica and Tropical Seawaters. (with R. M. Pfister) J. of Bact. 90: 863-872.

1965 Carbon assimilation of marine phytoplankton in Antarctica. (with E. F. Mandelli) Proceedings of the Nat. Acad. of Sci. 54: 437-444.

1965 Productivity of Microalgae in Antarctic Sea Ice. (with E. F. Mandelli). Sci. 149: 872-874.

1965 Studies on Some Long Island Sound Littoral Communities of Microorganisms and their primary productivity. (with A. Papek and J. Siebert). Bull. of the Torrey Bot. Club. 92.

1966 Production of a Pyrrole Antibiotic by a marine bacterium. (with R. M. Pfister and F. H. Leitz). Appli. Microbio. 14: 649-653.

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1966 Primary Productivity in the Gerlache and Bransfield Straits of Antarctica. (with E. F. Mandelli). J. of Mar. Res. 24, 1: 15-27.

1967 Carbon assimilation of marine flagellate blooms in neritic waters of Southern Puerto Rico. (with L. M. Burkholder and L. R. Almodóvar). Bull. of Mar. Sci. 17, 1: 1-15.

1967 Some chemical properties of Munida gregaria and Euphausia superba. J. Agric. Food Chem. 15: 713-720. (with E. F. Mandelli and P. Centanni).

1967 Studies on antimicrobial substances of sponges I. Isolation, purification and properties of a new bromine-containing antibacterial substance. J. of Antibiotics (Japan) XX: 200-203. (with G. M. Sharma).

1967 Studies on antimicrobial substances of sponges II. Structure and synthesis of a bromine-containing antibacterial compound from a marine sponge. Tetrahedron Letters 42: 4147-4150., (with G. M. Sharma).

1967 Studies on antimicrobial substances of sponges III. Chemical properties of some antibacterial compounds from marine sponges. Conf. of Mar. Tech. Soc. on Drugs from the Sea (in press) (with G. M. Sharma and B. Vig).

1967 Antibacterial Substances from the Sea. Conf. of MTS on Drugs from the Sea (in press).

1967 Primary productivity in surface waters of the South Pacific Ocean. (with L. M. Burkholder) Limnol. and Oceanogr. 12: 606-617.

1968 Some Patterns of B vitamin requirements of neritic marine bacteria. J. of Canadian Microbio. 14:537-543. (with S. Lewis).

1968 Studies of Primary Productivity in coastal waters of Southern Long Island, New York (with E. F. Mandelli, R. Brody and T. E. Doheny (submitted to Marine Biology for publication).

1968 Productivity and nutrient values of plants growing in the salt marshes of the Town of Hempstead, Long Island. (with H. F. Udell, J. Zarudsky, and T. E. Doheny).

1968 The Biology of eelgrass, with special reference to Nassau County, Long Island. (with T. E. Doheny) 61 pp. and 32 pp. of references. Submitted to Dept. of Conservation and Waterways Town of Hempstead, Long Island.

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1969 Antibiotics in sponges (with K. Ruetzer) Nature.

1969 Antimicrobial substances from the sea Lloydia.

1969 Antibiotics from marine microorganisms. Symposium on Food and Drugs from the Sea. Univ. Rhode Island, August, 1969. Publ. Marine Technol. Society.

1969 Some consequences of brine pollution in the Bahía Fosforescente. (with Cintrón and Maddux). In press. Limnol. Oceanogr.

Nombre: Máximo J. Cerame-Vivas

Fecha y lugar de nacimiento: 26 de febrero de 1936, Rio Piedras, P. R.

Educación:

B. S.	Universidad de Puerto Rico, 1957
M. A.	Universidad de Duke, 1961
Ph.D.	Universidad de Duke, 1964

Experiencia profesional:

1957-1959	Instructor de Biología, Universidad de Puerto Rico
1960-1961	(Verano) Instructor, Ecología Marina e Invertebrados Marinos, Duke University Marine Laboratory
1962	Abordo del U.S.C. & G.S. EXPLORER
1963	(Verano) Instructor, Ecología Marina, Duke University Marine Laboratory
1961-1964	Investigador Auxiliar Proyecto Cabo Hateras, Duke University
1964	Catedrático Auxiliar, Departamento de Biología, Universidad de Puerto Rico
1965	A cargo del curso de Ecología Marina, Instituto de Biología Marina, Colegio de Agricultura y Artes Mecánicas
1965	(Verano) Director Interino, Departamento de Biología, Universidad de Puerto Rico
1966	Secretario de la Comisión Especial Sobre Conservación de la Legislatura
1967	Director, Instituto de Biología Marina, Colegio de Agricultura y Artes Mecánicas
1967	Catedrático Asociado, Departamento de Ciencias Marinas, Colegio de Agricultura y Artes Mecánicas
1969	Miembro, Committee on Ecological Research for the Interoceanic Canal, National Academy of Sciences
1969	Instructor de Buceo, National Association of Underwater Instructors
1969	Miembro Comité Asesor al Departamento de Recursos Naturales, Obras Públicas, Gobierno de Puerto Rico

Honores recibidos:

1963	Sigma Xi
1966	Conferenciante Invitado, Sigma Xi-RESA, Hoffman-La Roche
1967	Fellow, American Association for the Advancement of Science
1968	Miembro, International Association of Professional Diving Scientists

Sociedades a que pertenece:

BBB Biological Society
Society of the Sigma Xi
American Society of Zoologist
American Society of Limnology and Oceanography
American Ecological Society
American Association for the Advancement of Science
American Institute of Biological Science
National Association of Underwater Instructors

Publicaciones:

Cerame-Vivas, Máximo J. 1951. Separation of Cell Layers in Hydra. Roux' Archiv fur Entwiclungsmechanik 153: 213-216.

_____ and C. G. Bookhout. 1961. Differentiation of Hydra Interstitial Cells in Culture. Journal of the Elisha Mitchell Scientific vol. 77; 2: 75.

_____ 1962. A method for Holding Small Aquatic Invertebrates. Turtox News vol. 40; 2: 30-31.

_____, Austin B. Williams and I. E. Gray. 1961. New Decapod Crustacean Records for the Coast of North Carolina. Crustaceana, vol. 5; 2: 157-159.

Gray, I. E. and M. J. Cerame-Vivas. 1951. The Circulation of Surfaces Waters in Raleigh Bay, North Carolina. Limnology and Oceanography, vol. 3; 3: 330-337.

Gray, I. E. and M. J. Cerame-Vivas. 1953. Circulation in Raleigh Bay, North Carolina, and its Relation to the Barrier at Cape Hatteras. ASB Bull. vol. 10; 2, p. 23.

Cerame-Vivas, Máximo J. 1953. Los Crustáceos de Puerto Rico. Chapter in "Natural History of P. R." for the Institute of Puertorrican Culture. (in press).

_____, and I. E. Gray. 1954. The presence of a sixth lunule in the sand dollar, Mellita quinquiesperforata. Journal of Mar. Sci. Gulf & Caribb. vol. 14, 2: 303-305.

Humm, M. J., and M. J. Cerame-Vivas. 1954. Struvea pulcherrima in North Carolina. Jour. Elisha Mitchell Sci. Soc., vol. 70; 1: 23-24.

Ross, Arnold, M. J. Cerame-Vivas, and L. R. McCleskey. 1954. New Barnacle Records for the Coast of North Carolina. Crustaceana vol. 7; p. 312-313.

Cerame-Vivas, Máximo J. and I. E. Gray. 1956. The Distributional Pattern of Benthic Invertebrates of the Coast of North Carolina, Ecology, 47-2: 260-270.

Gray, I. E., M. E. Downey and M. J. Cerame-Vivas. 1958. Sea-Stars of North Carolina. Fishery Bull. U.S.F. & W.S. 57-1: 127-168.

Cerame-Vivas, M. J. 1959. The Wreck of the Ocean Eagle. Sea Frontiers 15-4: 224-231.

Donaciones Recibidas:

1967-1970 Oficina de Investigaciones Navales NR-104-959. "Biogeografía de los organismos de fondo de las Indias Occidentales. 3 años $33,720.00

Estudiantes Graduados Supervisados al Presente:

José A. González-Liboy

Nombre: Bertha M. Dana de Cutress

Fecha y lugar de nacimiento: 23 de diciembre de 1926, Pullman, Washington

Educación:

B. S. Universidad del Estado de Oregon, 1948
M. S. Universidad del Estado de Oregon, 1949

Experiencia profesional:

1938-1942	Ayudante, Biblioteca de la Universidad del Estado de Oregon
1943-1949	Instructora e Investigadora Auxiliar, Departamento de Zoología, Universidad del Estado de Oregon
1949-1954	Auxiliar de Investigaciones y Secretaria Departamental, Departamento de Zoología, Universidad de Hawaii
1953-1954	Zoóloga Sistemática para identificar pepinos de mar, Proyecto Enivetok, Comisión de Energía Atómica.
1954-1955	Secretaria, Departamento de Patología, Pineapple Research Institute, Honolulu, Hawaii
1955-1957	Investigador Principal, Estudio de espinas de erizos del
1958-1962	Hemisferio Occidental del Cretácico al Reciente, bajo donativo de Carter Oil Company, administrado pro Smithsonian Institution.
1962-1964	Investigador Asociado, donativo de la NSF, Dr. Porter Kier, investigador principal, administrado por Smithsonian Institution.
1965	Investigador Asociado y Ayudante Administrativo, Instituto de Biología Marina, CAAM.

Honores recibidos:

Phi Kappa Phi
Sigma Xi

Sociedades a que pertenece:

Society of Systematic Zoologists
Paleontological Research Institute
Biological Society of Washington
Sigma Xi
Phi Kappa Phi
Association of Island Marine Laboratories of the Caribbean

Publicaciones:

1965. Observations on growth in Eucidaris tribuloides (Lamarck), with special reference to the origin of the oral primary spines. Bull. Mar. Sci., 15(4): 797-334.

Manuscripts in preparation on:

Cretaceous to Recent Cidaroidea of the Caribbean Area
Cretaceous to Recent Cidaroidea of the Atlantic and Gulf States of the United States.

Research Grants Received:

1969 University of Puerto Rico, Mayaguez, Comité de Investigaciones. Project No. 69-24: Completion of manuscript on Cretaceous to Recent Cidaroidea of the Caribbean Area. $1,630.

Nombre: Charles E. Cutress

Fecha y lugar de nacimiento: 3 de marzo de 1921, Calgary, Alberta, Canada (ciudadano naturalizado en 1943)

Educación:

B. S. Universidad del Estado de Oregon, 1943
M.S. Universidad del Estado de Oregon, 1949
Requisitos para el doctorado, menos la tesis, completados en la Universidad de Hawaii

Experiencia profesional:

1947-1949	Auxiliar de Investigación, Departamento de Zoología Universidad del Estado de Oregon
1949-1951	Auxiliar de Instrucción, Departamento de Zoología, Universidad del Estado de Oregon
1951-1955	"Research Fellow", U. S. Public Health Service, Universidad de Hawaii.
1954	Zoólogo Sistemático (anémonas), Proyecto Eniwetok, Comisión de Energía Atómica
1955-1965	Curador Asociado, División de Invertebrados Marinos, United States National Museum, Washington, D. C.
1957	Expedición Smithsonian-Bredin, a la Polinesia Francesa
1959	Consultor sobre Actinaria, Duke University Marine Laboratory, Cabo Hateras.
1962	Investigador visitante, Museo Británico (Nat. Hist.)
1963	Participante Oficial, Programa Biológico de los E. E. U. U., Expedición Internacional al Océano Indico
1963	Investigador visitante, Laboratorio Marino de Nápoles.
1964	Consultor sobre Actinaria, Friday Harbor Laboratory, Universidad de Washington
1965	Consultor sobre Actinaria del Golfo de Méjico en Puerto Peñasco, Méjico, para la Universidad de Arizona
1965	Investigador Asociado y Catedrático Asociado, Departamento de Ciencias Marinas.

Honores recibidos:

Sigma Xi

Sociedades a que pertenece:

Society of Systematic Zoology
American Society of Zoologists
Association of Island Marine Laboratories of the Caribbean,
Secretary-Treasurer, 1969-date.

American Association for the Advancement of Science, Fellow
American Institute of Biological Sciences
Biological Society of Washington
Sigma Xi

Publications:

1949. Pratt, Ivan and Charles E. Cutress. Olssoniella chivosca, n. sp. (Trematoda: Dicrocoeliidae) from the Western Evening Grosbeak. Journ. Parasit., 35 (3): 361-363.

1954. Chu, George W. T. C. and Charles E. Cutress. Austrobilharzia variglandis (Miller and Northup, 1926) Penner, 1953 (Trematoda: Schistosomatidae) in Hawaii with notes on its biology. Journ. Parasit., 40 (5): 515-523.

1955. Chu, George W. T. C. and Charles E. Cutress. Dermatitis due to contact with the hydroid Syncoryn mirabilis (Agassiz, 1862). Hawaii Med. Journ., 14: 403-404.

1955. Cutress, Charles E. An interpretation of the structure and distribution of cnidae in Anthozoa. Syst. Zool., 4 (3): 120-137.

1959. Cutress, Charles E. Book review on the Hydromedusae of the Atlantic Ocean and adjacent waters by P. L. Kramp. Science, 130 (3372): 384.

1960. Cutress, Charles E. and Willis E. Pequegnat. Three new species of Zoantharia from California. Pac. Sci., 14 (2): 89-100.

1961. Cutress, Charles E. Habrosanthus bathamae, n. gen., n. sp. (Actiniaria: Sagartiidae) from New Zealand. Trans. Roy. Soc. New Zealand, 1 (6): 95-101.

1969 Cutress, Charles E. and Donald M. Ross. The sea anemone Calliactis tricolor and its association with the hermit crab Dardanus venosus. Journ. Zool., 158 (2): 225-241.

In press. Ross, Donald M., Leonard Sutton and Charles E. Cutress. The behavioral physiology of tropical Calliactis. II. Calliactis tricolor and its pagurid, calappid and maiid partners in the Caribbean. Journ. Zool. Soc. London. 40 ms. pp.

In press. Cutress, Charles E. Sea anemones. Chapter in revision of Edmondson's "Reef and shore fauna of Hawaii". 35 ms. pp.

In press. Cutress, Charles E. Actiniaria. In Biological Survey of Prince Edward and Marion Island. 3 ms. pp.

Grants

1969-71 U. S. Department of Interior, Bureau of Commercial Fisheries (through Puerto Rico Department of Agriculture), Jellyfish Proyect No. JF2-6-1: Investigation of the biology and control of noxious coelenterates occurring in the coastal waters of Puerto Rico." 3 years, $76,005.00.

These committee chairman:

John T. Rees. Aspects of growth and nutrition in the octocoral Telesto riisei. (Completed 1969).

David West. Biology of a symbiotic Parazoanthus. (Proposed).

John Studebaker. Biology and behavior of Carybdea marsupialis. (Proposed).

Name: William H. Eger

Date and place of Birth: June 22, 1938, Detroit, Michigan

Education:

Eastern Michigan University, B. S. 1960
University of Hawaii, M.S. 1963
University of Arizona, Ph.D. 1970

Experience:

Assistant Curator of Fishes, Department of Biological Sciences, University of Arizona, 1965-1967.

Teaching Assistant, Department of Biological Sciences, University of Arizona: Ichthyology, 1964-65; Marine Ecology, 1964-65, General Zoology, 1963.

Research Assistant, Hawaii Marine Laboratory, University of Hawaii, 1961-63: Poisonous Fishes Project.

Research Assistant, University of Arizona (in Hawaii), for Dr. Albert R. Mead, Ecology & Etiology of the Giant African Land Snail, 1963.

Research Assistant, University of Hawaii, Department of Plant Pathology, 1961.

Present Position:

Assistant Professor and Curator of Fishes, Department of Marine Sciences, University of P. R. 1967 -

Field of Interest:

Ichthyology; ecology and physiology of fishes; marine biotoxicology.

Society Membership:

American Association for the Advancement of Science
American Institute of Biological Sciences
Sigma Xi
American Society of Ichthyologists and Herpetologists
American Fisheries Society

Publications

Eger, W. H. 1963. MS Thesis, Univ. Hawaii. An Exotoxin Produced by the Puffer, Arothron hispidus, with notes on other Plactognath fishes. 88 p., 17 Figs., 9 Tables.

Thomson, D. A. and W. H. Eger, 1964. Univ. of Arizona Press. Key to the Families of the Inshore Teleosts of the Upper Gulf of California, 27 p.

Thomson, D. A. and W. H. Eger, 1966. Gulf of California Field Guide Series No. 2, Univ. of Arizona Press. Guide to the Families of the Common Fishes of the Gulf of California, 53 p.

Eger, W. H., 1968. Presented at the annual meeting of American Soc. Ichthyologists and Herpetologists. The Survival and Desiccation of Clingfishes (Gobiesocidae) in the Gulf of California.

Eger, W. H. 1969. For the Public Health Department. The Relationship between a fish kill in the Guanajibo River system and sugar cane waste disposal. University of Puerto Rico.

Eger, W. H. 1969. The Secretion of toxin from the skin of Pufferfishes (Tetraodontidae). Amer. Zoologist v. 9 No. 4

Eger, W. H. and J. G. Starkus. 1969. Morphological aspects of the skin from toxic Caribbean pufferfishes. Proc. Assoc. Island Mar. Labs.

Eger, W. H. (1970). Ph. D. Dissertation, Univ. of Arizona. Ecological and Physiological adaptations of Intertidal Clingfishes (Gobiesocidae) in the Gulf of California.

Eger, W. H. (in prep). The ecology of Clingfishes in the northern Gulf of Calif. In: The Environmental Biology of the Northern Gulf of California. Ed. D. A. Thomson, Univ. of Arizona Press.

Eger, W. H. (in prep). Extreme Intertidal temperature cycles and survival of benthic fishes.

Eger, W. H. (in prep). The utilization of atmospheric oxygen by Clingfishes.

Eger, W. H. (in prep). Report of a venomous moray eel, Gymnothorax acellatus.

Graduate Students Supervised at Present: (Chairman)

John Starkus
Jorge Rivera López
Charles Milstein
Ilse Sanders

Name: Graham Sherwood Giese

Date of birth: October 13, 1931

Education:

B. S., Trinity College (Hartford) Connecticut), 1953
M.S., University of Rhode Island, 1964
Ph. D., University of Chicago, 1966

Experience:

1956–1962	Research Assistant, Woods Hole Oceanographic Institution
1967–	Assistant Scientist, Woods Hole Oceanographic Institution
1967– present	Assistant Professor, Physical Oceanographer, Department of Marine Sciences, University of Puerto Rico
1963–1964	U. S. Fish and Wildlife Service Fellowship in Oceanography
1964–1966	N. A. S. A. Traineeship

Societies:

Member, American Association for the Advancement of Science
American Geophysical Union
New York Academy of Sciences
Society of the Sigma Xi

Publications:

1960 Zeigler, J. M., W. S. Hoffmeister, G. S. Giese, and H. J. Tasha, Discovery of Eocene sediments in subsurface of Cape Cod Science, v. 132, n. 3437, p. 1397–1398.

1963 Giese, G. S. Billingsgate Shoal. Oceanus, v. 10, n. 1, p.8–13

1964 Zeigler, J. M., S. D. Tuttle, H. J. Tasha, and G. S. Giese, Pleistocene geology of outer Cape Cod, Massachusetts. Geol. Soc. Amer. Bull., v. 75, n. 8, p. 705–714.

1964 Zeigler, J. M., S.D. Tuttle, G. S. Giese, and H. J. Tasha, Residence time of sand composing the becches and bars of Outer Cape Cod. Proc. 9th Conf. on Coastal Engineering, p. 403–416.

1965 Zeigler, J. M., S. D. Tuttle, G. S. Giese, and H. J. Tasha, The age and development of the Provincelands Hook, Outer Cape Cod, Massachusetts. Limnology and Oceanography, v. 10, p. R298–R311.

1967 Giese, G. S., Movement and shape sorting of beach pebbles (abs.) Northeastern Section Meeting, Geological Society of American, March 16-18, 1967.

1968 Giese, G. S., The manner and conditions of formation of rhomboid ripples (abs.) Trans. American Geophysical Union, v. 49, n. 1, p. 190.

1969 Giese, G. S., Wave period and the swash zone energy balance. Proc. 11th Conf. on Coastal Engineering, v. 1, p. 401-414.

In press Giese, G. S., Physical measurements of the coastal water south of western Puerto Rico. Proc. Symposium of Investigations and Resources of the Caribbean Sea and Adjacent Regions, U.N.E.S.C.O.

In press Zeigler, J.M., and G. S. Giese, Investigations of Escollo de Arenas, Vieques Island, Puerto Rico. Proc 5th Caribbean Geological Congress.

In press Giese, G. S., Periodic sea level fluctuations at La Parguera, Puerto Rico (abs.) Proc 8th Meeting Assoc. of Island Marine Laboratories of the Caribbean.

Nombre: Juan Gerardo González-Lagoa

Fecha y lugar de nacimiento: 19 de enero de 1933, Mayaguez, P. R.

Educación:

B.S. Universidad de Puerto Rico, CAAM, 1955
M.S. Colegio Texas A & M, 1957

Experiencia profesional:

1956-1957	Participación en seis cruceros a bordo del R/V JAKKULA en aguas del Golfo de Méjico.
1957-1960	Investigador e Instructor, Instituto de Biología Marina, CAAM.
1960	Investigador y Catedrático Auxiliar, Instituto de Biología Marina, CAAM.

Honores Recibidos:

Beta Beta Beta

Sociedades a que pertenece:

Zeta Alpha (BBB)
Association of Island Marine Laboratories of the Caribbean, Secretary-Treasurer

Publicaciones:

Coker, Robert E. and Juan G. González, 1960. Limnetic Copepod Population of La Parguera, Puerto Rico. Journ. Elisha Mitchell Sc. Soc. 76 (1): 8-28.

Bowman, Thomas E. and Juan G. González, 1961. Four New Species of Pseudocyclops (Copepoda: Calanoida) from Puerto Rico. Proc. U. S. Nat. Mus. 113 (3452): 37-59.

González, Juan G. and Thomas E. Bowman. Planktonic Copepods from Bahia Fosforescente, Puerto Rico and adjacent waters. Proc. U. S. Nat. Mus., 117 (3513: 241-304.

Glynn, Peter W., Luis R. Almodóvar and Juan G. González, 1964. Effects of hurricane Edith on marine life in La Parguera, Puerto Rico. Carib. Journ. Sci. 4 (2 & 3): 335-345.

Publications :

Coker, Robert E. and Juan G. González, 1960.
Limnetic Copepod Population of La Parguera, Puerto Rico.
Jour. Elisha Mitchell Sc. Soc. 76 (1): 8-23.

Bowman, Thomas E. and Juan G. González, 1961.
Four New Species of Pseudocyclops (Copepoda: Calanoida) from Puerto Rico. Proc. U.S. Nat. Aus. 113 (3452): 37-59.

González, Juan G. and Thomas E. Bowman
Planktonic Copepods from Bahía Fosforescente, Puerto Rico and adjacent waters. Proc. U. S. Nat. Aus., 117 (3513): 241-304.

Glynn, Peter W., Luis R. Almodóvar and Juan G. González, 1964.
Effects of hurricane Edith on marine life in La Parguera, Puerto Rico.
Carib. J. Sci. 4 (2 & 3): 335-345.

Randall, John E. y Juan G. González, 1963.
El Instituto de Biología Marina. Revista de Agricultura de P. R.
Vol. 50(1): 31-39.

Projects :

Survey of the Tallaboa - Guayanilla Bays, (1961) - Dupont.
Survey of the Punta Cabullón Area, (1961) - Dupont
Primary productivity of the oceanic and neritic waters of the west coasts of Puerto Rico (1964-65) - Supported by U. S. Office of Naval Research.
Survey of the Tallaboa - Guayanilla Bays (1966-67) - Texaco.
A study of Puerto Mosquito, Vieques, another bioluminescent bay with the same characteristics of Bahía Fosforescente, Puerto Rico in La Parguera.

Nombre: William S. Maddux

Fecha y lugar de nacimiento: 13 de diciembre de 1930, Trenton, New Jersey

Educación:

B. Sc. University of Manitoba 1957

M.A. Princeton University 1963

Ph.D. Princeton University 1963

Experiencia profesional:

1951-1952 Engineering Aide, Missile Test Center, Patrick Air Force Base, Cocoa, Florida.

1952-1954 U. S. Marine Corps.

1954 Engineering Assistant, RCA Laboratories, Princeton, New Jersey.

1957-1958 Project Engineer, RCA Laboratories, Princeton, New Jersey.

1959 Glenny-Libby Fellow, Princeton University.

1959 Summer Fellow, Woods Hole Oceanographic Institution.

1960-1962 Teaching Assistant, Princeton University.

1963 Research Assistant, Princeton University.

1963-1964 Ford Post-Doctoral Fellow, Woods Hole Oceanographic Institution. (With Dr. John W. Kanwisher).

1965 Assistant Scientist, Woods Hole Oceanographic Institution

1967 Assistant Professor, Institute of Marine Biology, CAAM

Honores recibidos:

1960 Marine Biological Laboratory Fellowship

Sociedades a que pertenece:

Sigma Xi

AAAS

Corporation of Bermuda Biological Station

Patentes:

Dos Instrumentos

Publicaciones:

Maddux, W. S., and R. F. Jones 1964, Some Interactions of Temperature, Light Intensity and Nutrient Concentration during the continuous culture of Nitzchia closterium and Tetrasalmis sp. Limnol. & Oceanog. 9: 79-86.

Maddux, W. S., and J. W. Kanwisher, 1965. An In Situ particle counter. Limnol. & Oceanog. 10, Suppl. R; 162-168.

Estudiantes Graduados Supervisados al Presente (Chairman)

Gilberto Cintrón

CURRICULUM VITAE

Name: Francisco A. Pagán-Font

Place of Birth: Mayaguez, Puerto Rico

Personal:

Date of Birth: June 13, 1940

Married with 3 children

Degrees:

B. S. - College of Agriculture and Mechanical Arts (University of Puerto Rico), 1963. Zoology.

M.S. - College of Agriculture and Mechanical Arts (University of Puerto Rico), 1967. Biological Sciences (Marine Biology).

Ph. D.-Auburn University, August, 1970. Fisheries Management (Aquaculture).

Positions Held:

Graduate Research Assistant under Office of Naval Research Grant. CAAM (U.P.R.). February, 1964 - January, 1965.

Graduate Research Assistant under National Science Foundation Grant. CAAM (U. P. R.) July, 1965-June, 1966.

Graduate Research Assistant under Office of Naval Research Grant. CAAM (U. P. R.) September, 1966- August, 1967.

Graduate Research Assistant under Rockefeller Foundation Grant. Auburn University. June, 1969- July, 1970.

Assistant Professor, Department of Marine Sciences, University of Puerto Rico, Mayaguez, Puerto Rico - Present.

Other Positions or Experience:

Consultant in fisheries and aquaculture during survey of the fisheries of Colombia under U. S. A. I. D. - Auburn University Project "Increasing Fish Production by Improved Fishcultures".

Consultant in fisheries and aquaculture during survey of the fisheries of Ecuador under U. S. A. I. D. - Auburn University Project " Increasing Fish

Production by Improved Fishcultures".

Scholarship:

From Economic Development Administration, Commonwealth of Puerto Rico September, 1967-1970.

Professional Societies:

American Fisheries Society
American Society of Oceanography
Association of Island Marine Laboratories of the Caribbean
Gulf and Caribbean Fisheries Institute
The International Oceanographic Foundation
The World Mariculture Society (Chartered Member)

Certificates:

Certified SCUBA Diver by YMCA. May 17, 1967.

Meetings Attended:

Conference on Marine Aquaculture, Oregon State University, Newport, Oregon, May 22-25, 1968.

Association of Island Marine Laboratories of the Caribbean, Barbados, B.W. I. August 22-27, 1966.

Publications:

Almodóvar, Luis R., and F. A. Pagán. 1967. Notes on the algae of Barbados. Nova Hedwigia. 13 (1 & 2): 111-115.

(In press) Almodóvar, Luis R., and F. A. Pagán. Notes on a mangrove lagoon and mangrove channels at La Parguera, Puerto Rico. Nova Hedwigia.

Pagán, Francisco A., 1969. Cage culture of Tilapia. FAO Fish Culture Bulletin, 2 (1): 6.

Swingle, H. S., and F. A. Pagán. 1969. Fishculture survey report for Colombia. Auburn University Project: AID/csd-2270. 63 p.

Swingle, H. S., and F. A. Pagán. 1969. Fishculture survey report for Ecuador. Auburn University Project: AID/csd-2270. 46 p.

Pagán, Francisco A., and H. Austin, 1970. Report on a fish kill at Laguna Joyuda, Western Puerto Rico, in the summer, 1967. Carib. J. Sci., 10 (3-4): 203-208.

Pagán, Francisco A. 1970. Cage culture of Tilapia. FAO Aquaculture Bulletin, 3 (1): 6.

Title M. S. Thesis:

A study of the commensal relationship between the conchfish, Astrapogon stellatus (Cope) and the queen conch, Strombus gigas Linnaeus, in southwestern Puerto Rico.

Dissertation Research (Ph. D. degree):

Cage culture of the cichlid fish, Tilapia aurea (Steindachner).

Language Proficiency

	Proficiency
First language : Spanish	Excellent
Second language: English	Excellent
Third language: Portuguese	Fair

Name: Robert Y. Ting

Date and Place of Birth: January 14, 1932 - Keelung, Taiwan, China

Marital Status: married - Two children

Education:

Primary: Futaba Elemental School, Keelung, Taiwan, China
Secondary: Chien Kuo High School, Taipei, Taiwan, China
College: St. Benedict's College, Atchison, Kansas - 1951-52
University of Washington, Seattle, Wash.
BS in Fisheries. June 1955
University of Washington, Seattle, Wash.
Ph.D. in Fisheries Biology. June 1965.

Course work at graduate level:

Population Dynamics	15 quarter hours
Statistics	15 quarter hours
Mathematics	15 quarter hours
Oceanography	10 quarter hours
Zoology	20 quarter hours
Fisheries	40 quarter hours

Experience:

Part-time Japanese translator for the Pacific Salmon Investigations Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Seattle, Washington. Translating Japanese fisheries literatures into English. March 1954 - June 1955.

Fisheries research biologist, Pacific Salmon Investigations, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Seattle, Washington. Senior biologist aboard various research vessels to carry out salmon sampling and oceanographic programs for the International North Pacific Fisheries Commision in the Gulf of Alaska, North Pacific and Bering Sea in 1955, 1956 and 1957. Acted as an official interpreter and translator for the U.S. section in the meetings of the International North Pacific Fisheries Commission in November, 1956. On loan to the Fisheries Research Institute, University of Washington for tagging salmon in the waters adjacent to the Aleutian Island in 1958. The use of morphometric method for the salmon racial study in 1959. June 1955 - March 1959

Research Assistant, College of Fisheries, University of Washington. January 1960 - March 1963

Pre-doctorate Associate, College of Fisheries, University of Washington. April 1963 - April 1965

Research Associate, College of Fisheries, University of Washington. Ecological study of the benthic animals in Puget Sound, Washington. May 1955 - January 1956.

Associate Scientist I, Marine Biology Program, Puerto Rico Nuclear Center, Mayaguez, Puerto Rico. The study of trace elements in marine organisms. February 1956 - April 1958.

Associate profesor, Department of Marine Sciences, University of Puerto Rico (30%). Associate Scientist, Puerto Rico Nuclear Center (20%). May 1958 to date.

Societies:

Phi Sigma
American Fisheries Society
American Institute of Biological Science
Ecological Society of America

Publications:

1952 Ecology and Taxonomy: A new bottom sampling mechanisms. In Research in Fisheries - 1952, College of Fisheries Contribution No. 139:29-30 (with R. Van Cleve).

1953 Sampling of demersal animal populations. In Research in Fisheries-1952, College of Fisheries Contribution No. 147:44-47 (with R. Van Cleve).

1955 Ecology of demersal animals: Problems in sampling. Ph.D. dissertation, University of Washington: 249 p.

1956 A new device for sampling marine demersal animals for ecological study. Limnology and Oceanography, Vol. II (3): 433-443 (with R. Van Cleve and J. Kent).

1958 The nature of the distribution of trace elements in anchovy (Anchoa lamprotaenia Hildebrand), Atlantic thread herring (Opisthonema oglinum LaSueur), and alga (Udotea flabellum Lamouroux). (In press) The proceedings of the symposium of the Second National Radio-ecological meeting, Ann Arbor, Michigan, 1957. (with V. Roman de Vega).

1959 Use of stable element distribution pattern for predicting distribution of radionuclides in Marine organisms Bio Science, Vol. 19 (12): 1032-1035

Research Grants Received:

1969-1970 Department of Agriculture Commonwealth of Puerto Rico. "Investigations on the resources potential of the spiny lobster (Panulirus argus). 1 year $13,740.00

Graduate students Supervised at Present (Chairman)

Charles Milstein
Fausto Lugo
Alvaro Yamhure
Juan Cabrera
Jorge López

Name: Thomas Robert Tosteson

Date and Place of Birth: January 25, 1929-Milwaukee, Wisconsin.

Education:

1944-47	Wauwatosa High School, Wauwatosa, Wisconsin.
1947-49	Beloit College, Beloit, Wisconsin.
1949-50	University of Pennsylvania.
1951-53	U. S. Army
1953-55	University of Penn. B. S. Degree, Feb., 1955.
1955-59	University of Penn. Graduate Sch. of Arts and Sciences. Research Assistant to L. V. Heilbrunn. Assistant to L. V. Heilbrunn at the University of Mexico (Nov.-Dec., 1958). Fellow of the National Institutes of Health (1958-59). Ph. D. Degree, June, 1959. Instructor in General Physiology, summer session (1959) at the University of Penn.
1960-62	Assistant Professor of Biology, University of Puerto Rico, Río Piedras, P. R.
1962-64	Postdoctoral Fellow, Pharmacology Dept., Medical School University of Louisville, Ky.
1964-	Associate Professor of Biology, University of Puerto Rico, Río Piedras, P. R.
1966-67	Acting Director of Graduate Program in Biology, University of Puerto Rico, Río Piedras, P. R.
1967	Associate Professor, Department of Marine Sciences University of P. R., Mayaguez, P. R.
1969	Professor, Department of Marine Sciences, University of Puerto Rico, Mayaguez, P. R.

Societies:

Sigma Xi
New York Academy of Sciences
AAAS

Publications:

1. A New Type of Carcinostatic Agent. L. V. Heilbrunn, T. R. Tosteson E. Davidson and W. L. Wilson. Nature, Nov. 2, 1957.

2. The Antimitotic and Carcinostatic Action of Ovarian Extracts. L. V. Heilbrunn, W. L. Wilson, T. R. Tosteson, E. Davidson, and R. J. Rutman. Biological Bulletin 113: 129-134. 1957.

3. Further Studies of the Antimitotic and Carcinostatic Action of Ovarian Extracts. T. R. Tosteson, S. A. Ferguson and L. V. Heilbrunn. (Preliminary Note). Biological Bulletin 113: 318. 1957.

4. The Carcinostatic Effect of Extracts Prepared from Cow Ovaries. T. R. Tosteson, S. A. Ferguson, E. Davidson, and R. J. Rutman. Journal of the National Cancer Institute 20: 1011-1022. 1958.

5. Further Studies of the Carcinostatic Effects Prepared from Cow Ovaries. T. R. Tosteson, S. A. Ferguson, and E. Davidson. A. M. A. Archives of Pathology, August, 1959.

6. The Effect of Subcellular Fractions of Ascites Tumor Cells on the Tumor-Host Relationship in Mice. E. H. Davidson and T. R. Tosteson. A. M. A. Archives of Pathology , August, 1959.

7. The Influence of the Melanocyte Stimulating Hormone (MSH) on the Osmotic Behavior of the Dermis of Frog Skin. T. R. Tosteson. Fed. Proc. 23: 206. 1964. (Abstract).

8. Aspectos Ecologicos de la Descarga de Efluentes Industriales (Petroquimicas) en la Bahía de Tallaboa. M. J. Cerame-Vivas, R. Keith Stewart, Lleys P. Parish, José Llavona Freyre and Thomas R. Tosteson, a technical report of the Department of Marine Sciences. University of Puerto Rico, Mayaguez, P. R. 1968.

9. Biographical Sketches of the principal investigators:

Research Grants Received:

1965-1968 National Science Foundation
"The effect of MSH on isolated frog skin".
3 years $13,000.00

Graduate Students Supervised at Present: (Chairman)

Michael Bradley
Evelina Alexander

Nombre: John M. Zeigler

Fecha y lugar de nacimiento: 23 de mayo de 1922, St. Augustine, Florida.

Educación:

B.S. Universidad de Colorado, 1947
Ph.D. Universidad de Harvard, 1954

Experiencia profesional:

1948-1950 Geólogo Petrolero, The California Company, Casper, Wyoming.
1950-1951 Geólogo de Campo, Segunda Expedición. Afghanistan.
1953-1967 Investigador Asociado, Woods Hole Oceanographic Institution.
1960-1967 Conferenciante, Departamento de Ciencias Geofísicas, Universidad de Chicago.
1968 Catedrático

Sociedades a que pertenece:

Sigma Xi

Publicaciones:

1957. Torphy, S.R. and Zeigler, J.M. (1957). Submarine Topography of Eastern Channel, Gulf of Maine; The Journal of Geology, vol. 65, no. 4, pp. 433-441.

1957. Zeigler, J.M., Athearn, W.D., and Small, H. (1957) Profiles across the Peru-Chile Trench; Deep-Sea Research, vol. 4, pp. 238-249.

1957. Zeigler, J.M., and Ronne, F.C. (1957) Time-Lapse Photography--an aid to studies of the shoreline; Research Reviews April 1957.

1958. Zeigler, J.M., Geological study of Shamshir Ghar cave, Southern Afghanistan, and report of terraces along Panjshir Valley near Kabul; Journal of Geology, vol. 66, no. 1, pp. 16-27.

1958. Miller, R.L., and Zeigler, J.M., A study of the relation between dynamics and sediment patterns in the region of shoaling waves. Vth International Sedimentological Congress, Geneva, Switzerland. In press-Eclogae Helveticae.

1958. Miller, R.L., and Zeigler, J.M., A model relating dinamics and sediment pattern in equilibrium in the region of shoaling waves, breaker zone, and foreshore; Journal of Geology, vol. 66, no. 4, pp. 417-441.

1959. Zeigler, J.M., Hayes, C.R., Tuttle, S.D., Beach changes during storms on Outer Cape Cod, Massachusetts; Journal of Geology, vol. 67, no. 3, pp. 318-336.

1959. Zeigler, J.M., Origin of the sea islands of the southeastern United States; The Geographic Review, vol. XLIX, no. 2, pp. 222-237.

1959. Zeigler, J.M., and Gill, Barbara, Tables and graphs for the settling velocity of quarts in water above the range of Stoke's law; Woods Hole Oceanographic Institution, Ref. no. 59-36.

1959. Northrop, John, Frosch, R.A., Frassetto, Roberto, and Zeigler, J.M., The Bermuda-New England Seamount Chain (preprint); International Oceanographic Congress, New York, 1959, p. 48.

1959. Zeigler, J.M., Sedimentary environments on the continental shelf of Northern South America (preprint); International Oceanographic Congress, New York, p. 670.

1959. Miller, R.L. and Zeigler, J.M., Comparison of theoretical near-bottom mass transport velocities with observed sediment size and sorting patterns. International Oceanographic Congress Preprints, 1959, pp. 635-636.

1960. Zeigler, J.M. and Perez-Mena, Ramón, Distribution de Sedimentas en el Golfo de Venequela; Memoria del III Cong. Geol. Venezolano torno II Bol. de Geologia, Caracus.

1960. Zeigler, J.M., Whitney, G.G. and Hayes, C.R., The Woods Hole Rapid Sediment Analyzer. Journal of Sed. Pet., Vol. 30, No. 3, pp. 490-495.

1960. Zeigler, J.M., Hoffmeister, W. S., Giese, Graham and Tasha, Herman, Discovery of Eocene Sediments in Subsurface of Cape Cod. Science, Vol. 132, No. 3437, pp. 1397-1398.

1961. Zeigler, J.M. and Tuttle, S.D., Beach Changes based on Daily Measurements of four Cape Cod Beaches. Journal of Geology, Vol. 68, No. 5, pp. 583-599.

1961. Miller, R.L. and Zeigler, J.M., A field and laboratory program for study of shoaling waves and sediment transport (abstract). Paper presented to N.S.F. meeting in California, October, 1961.

1962. Breslau, L.R., Zeigler, J.M., Owen, D.M., (1962) A self-contained portable tape recording system for use by SCUBA Divers. Bull. Inst. Oceanographique, Monaco No. 1235.

1964. Zeigler, J.M., The Hydrography and Sediments of the Gulf of Venezuela, Limnology and Oceanog. Vol. 9, No. 3, pp. 397-411.

1964. Miller, R. L. and Zeigler, J. M., A study of sediment distribution in the zone of shoaling waves over complicated bottom topography. 133-153. Papers in Marine Geology, R.L. Miller, editor, Macmillan, New York, 531 pages.

1964. Zeigler, J.M., Some Modern Approaches to Beach Studies, Oceanogr. Mar. Biol. Ann. Rev., 1964, pp. 77-95.

1964 Zeigler, J.M., Hayes, C., and Webb, D., Direct Readout of Sediment Analysis by Settling Tube for Computer Processing, Science, July 3, 1964, Vol. 145, No. 3627, p. 51.

1964 Zeigler, J.M, Tuttle, S.D., Tasha, H. and Giese, G., Pleistocene Geology of Outer Cape Cod. Geol. Soc. Amer. Bull, Vol. 75, No. 7, pp. 705-714.

1964 Zeigler, J.M., Tuttle, S.D., Tasha, H., and Giese G., Residence Time of sand composing the beaches and bars of Outer Cape Cod. Proc. 9th Conference on Coastal Engineering, Lisbon, Portugal. Cont. No. 1540.

1964 Miller, R.L. and Zeigler, J.M., The internal velocity field in breaking waves. Proc. 9th Conference on Coastal Engineering, Lisbon, Portugal, Cont. No. 1542.

1965 Zeigler, Tuttle, Tasha and Giese (1965). The Age and Development of the Provincelands Hook, Outer Cape Cod, Massachusetts.- Redfield Volume Lumin and Oceanog. Vol. 10 Supplement.

Mayores Informes no publicados:

1955 Zeigler, J.M., Seamounts near the Eastern Coast of North America-Classified-Woods Hole Oceanographic Institution Ref. No. 55-17.

1956 Zeigler, J. M. and von Arx, W.S., Errors in Loran navigation off the New England Coast with reference to ocean current and precise bathymetric surveys. Woods Hole Oceanographic Institution, Ref. No. 56-43.

1959 Zeigler, J.M., and Gilly Barbara, Tables and Graphs for the Settling Velocity of Quartz in water above the range of Stokes Law, Woods Hole Oceanographic Institution, Ref. No. 59-36.

1963 Zeigler and Tasha, Measurements of Coastal Currents. Proc. of 11th Coastal Engineering Cong. London.

In Press:

Zeigler and Athearn (1965) Hydrography and Sediments of the Gulf of Darien, Colombia. 4th Caribbean Geological Cong. Port of Spain.

1963 Zeigler, Circulation in Shallow Coastal Lagoons Proc. Symposium of Coastal Lagoons, Mexico City.

1969 Zeigler, J. M. and Giese, Graham, Sediments and Hydrography of Punta Arenas Shoal, Vieques Island, Puerto Rico. Proc. of the 5th Caribbean Geological Congress, St. Thomas, Virgin Islands.

Research Grants Received:

1963 Department of Public Works. "Investigation of Sand Deposits, Escollo Arenas. $9,000.00

Graduate Students Supervised at Present: (Chairman)

Manuel Hernandez-Avila

Apéndice 6

Donativos de Investigación vigentes en el Departamento de Ciencias Marinas

Donaciones Recibidas por el Departamento:

Almodóvar, Luis R.
Ecología de algas profundas fuera de La Parguera, Puerto Rico.
Oficina de Investigaciones Navales N-000-14-16 C0330

$ 12,440.00

El estudio ecológico de las algas marinas de los manglares de Puerto Rico. Fundación Nacional de Ciencias GB5936

16,500.00

Cerame-Vivas, Máximo J.
Biogeografía de los organismos de fondo de las Indias Occidentales.
Oficina de Investigaciones Navales NR- 104-959.

33,720.00

Estudio ecológico del Puerto de Yabucoa.
Departamento de Salud y Obras Públicas, ELA

25,312.00

Cutress, Charles M.
Investigación de biología y control de coelenterados nocivos que se encuentran en aguas costaneras de Puerto Rico. Departamento de lo Interior Federal y Departamento de Agricultura local.

76,005.00

Ting, Robert Y.
Investigation on the Resource Potential of the Spiny Lobster in Puerto Rico. Departamento de lo Interior Federal y Departamento de Agricultura local.

63,741.00

Zeigler, John M.
Hidrodinámica e hidrografía de Escollo de Arenas en la Isla de Vieques. Departamento de Obras Públicas, ELA

9,660.00

TOTAL: $ 237,378.00

Apéndice 7

Recursos bibliotecarios en el

Departamento de Ciencias Marinas. Revistas

Revistas de Ciencias Marinas en la Biblioteca General del CAAM

Belgique. Musée royal d'Histoire Naturelle, Bulletin

Deep Sea Research

Fisheries Research Board of Canada, Journal

Johnsonia

Journal of Marine Research

Marine Biological Association of the United Kingdom, Journal

Monaco. Institut Oceanographique, Bulletin

Naval Research Logistics Quarterly

Oceanic Index

Oceanus

Shore and Beach

Tide

U. S. Bureau of Ships, Journal

Otras Revistas en la Biblioteca General de Utilidad

American Journal of Physiology

American Journal of Science

Anatomical Record

Annales Mycologici

Annals of Botany

Biological Abstracts

Biological Bulletin

Canadian Journal of Science

Canadian Journal of Zoology

Malacología
Marine Geology
Underwater Naturalist
Zoological Record

En canje por "Contributions"

Acta Adriática (Yugoslavia)
Acta Biológica Venezuelica
Acta Botánica (Brazil)
Acta Botánica Croática (Yugoslavia)
Allan Hancock Foundation, University of California

Atlantic Expedition Reports
Contributions
Monographs in Marine Biology
Occasional Papers
Pacific Expedition Reports
Studies in Antarctic Oceanology

Atoll Research Bulletin
Bulletin of Marine Ecology
Bulletin of Marine Science
Caribbean Journal of Science
Caribbean Marine Biological Institute, N. A., Collected Papers
Cape Haze Marine Biological Laboratory, Collected Papers
Chesapeake Bay Institute, Collected Reprints
Chesapeake Bay Institute, Technological Reports
Chesapeake Science
Climatological Data, Puerto Rico and the Virgin Islands
Climatological Data, West Indies and Caribbean
Commercial Fisheries Abstracts
Commercial Fisheries Review
Dove Marine Laboratory, Contributions
Estacao de Biologia Marina, Universidade do Cedra, Brazil, Arquivos
Florida State Museum, Bulletin
Florida State University, Oceanography Institute, Miscellaneous Reports
FAO, Current bibliography for aquatic sciences and fisheries
FAO, numerous other publications
Great Lakes Research Division, Institute of Science and Technology, University of Michigan, Proceedings of Conference on Great Lakes Research
Gulf and Caribbean Fisheries Institute, Proceedings
Gulf Research Reports
Hawaii Marine Laboratory, Contributions
Hokkaido University, Bulletin of Faculty of Fisheries

Hokkaido University, Data Records of Oceanographic Observations & Exploratory Fishing
Hokkaido University, Memoirs of the Faculty of Fisheries
Institut Francais d'Afrique Noire, Bulletin
Institut Oceanographique (Monaco), Annales
Institute of Marine Science, University of Miami, Publications
Instituto de Biología Marina, Mar del Plata, Argentina, Boletín
Instituto de Biología Marina, Memoria Anual
Instituto de Fomento Pesquero (Chile), Publications
Instituto Italiano di Hidrobiología, Memoire
Instituto Investigaciones Pesquera (Spain), Investigaciones Pesquera
Instituto Investigaciones Pesquera Reunión sobre Productividad y Pesquerías
Instituto Oceanográfico, Universidad de Oriente (Venezuela), Boletín
Instituto za Oceanografihu i Ribarstvo (Yogoslavia), Reports
Instituto de Meteorología Náutica (Mexico), Boletín Climático
Instituto de Pesquisas da Marinha (Brazil), Notas Technicas
Israel, Sea Fisheries Research Station, Contributions
Israel, Sea Fisheries Research Station, Bulletins
Israel, Sea Fisheries Research Station, Israel Red Sea Expedition Reports
International Marine Science (UNESCO)
Lagena (Venezuela)
Limnology and Oceanography
Lerner Marine Laboratory, Collected Reprints
Louisiana State University, Occasional Papers
Japanese Antarctic Research Expedition, Jare Scientific Reports
Mar y Pesca (Cuba)
Malacología
Maritimes
Micronesica
Miscki Marine Biological Institue, Kyoto University, Bulletin
Miscelánea Zoológica (España)
Mitteilungen aus dem Hamburgischeb Zoologischen Museum und Institut
Narragansett Marine Laboratory, Collected Reprints
National Institute of Oceanography, Collected Reprints
National Science Foundation, Annual Report
Natur und Museum (Germany)
Netherland Journal of Sea Research
Naval Research Review
Ocean Research Institute, University of Tokyo, Collected Reprints
Oceanographic (Cahiers, France)
Office of Naval Research, European Scientific Notes and Technical Reports
Oregon State University, Department of Oceanography, Collected Reprints
Pacific Science
Poeyana
Perú, Instituto de Investigación de los Recursos Marinos
Progressive Fish Culturist
Pubblicazion della Stazione Zoologica di Napoli

Prague Institute of Chemical Technology, Scientific Papers
Puerto Rico Nuclear Center, Progress Reports
Sarsia
Scottish Marine Biological Association, Collected Reprints
Scripps Institution of Oceanography, Contributions
Sea Frontiers
Sea Secrets
Seto Marine Biological Laboratory, Publications
Skin Diver
Smithsonian Instituion, Miscellaneous Collection
Stahlia
Stanford Ichthyological Bulletin
Studies on the Fauna of Curacao and other Caribbean Islands
Studies on the Fauna of Suriname and other Guyanas
Sudene, Informacoes a Industria de Pesca
Systematic Zoology
Texas A & M, Contributions in Oceanography & Meteorology
Texas A & M, Research Reports
Tulane Studies in Zoology
U. S. Fish and Wildlife Service, Fishery Bulletin
U. S. Fish and Wiidlife Service, Research Reports
U. S. Fish and Wildlife Service, Special Scientific Reports, Fisheries
U. S. Fish and Wildlife Service, Bulletin
Underwater Naturalist
UNESCO International Indian Ocean Expedition, Collected Reprints
UNESCO International Oceanographic Tables
UNESCO Technical Papers in Marine Science
U. S. Dept. of Health, Education & Welfare, Environmental Health Series
U. S. National Museum, Bulletins
U. S. Naval Oceanographic Data Center, Catalog Series
U. S. Naval Oceanographic Data Center, General Series
U. S. Naval Oceanographic Data Center, Manual Series
U. S. Naval Oceanographic Data Center, Newsletters
U. S. Naval Oceanographic Office, Special Reports
U. S. Naval Oceanographic Office, Technical Reports
Vie et Milieu, Series B and C
Zoológica
Zoological Record

Revistas de Ciencias Marinas y Disciplinas Relacionadas
en la Biblioteca de Biología Marina

Ecology

Ecological Monographs

Geological Magazine

Growth

Journal of Bacteriology

Journal of Biological Chemistry

Journal of Ecology

Journal of Experimental Zoology

Journal of General Physiology

Journal of Geology

Journal of Morphology

Mycología

Natural History

Nature

Parasitology

Physiological Reviews

Physiological Zoology

Quarterly Review of Biology

Subscripciones

Copeia
Ecological Monographs (1945-1955)
Ecology (1922-1960)
Limnology and Oceanography

Apéndice 8

Programa de diseño del nuevo

edificio de Ciencias Marinas en Magueyes

General Design Criteria for the Proposed Magueyes Building

A. Due to the nature of a research facility, maximum flexibility should be provided for in terms of the interchangeability of spacial uses. Future utility service capability for all teaching and lab spaces will be considered.

B. Building must reflect the nature of the interior activities, that of a marine laboratory.

C. The design will be in keeping not only with the site but with the climatic conditions of the area.

D. The proposed budget on hand is approximately $150,000 for first phase. Due to the necessity for expansion, the total complex has been planned at the preliminary phase and allowance made for this expansion so that the construction of second phase least disturbs the continual use of the building.

Interior Space Requirements

A. Watertable Area:

1. Location: This space, more than any other, symbolizes the central activity of the building. It would be desirable to have it as centrally located as possible, within view of the other wet labs and teaching spaces. This might be an interesting area for the public to enter, though care must be taken to keep it protected from actual contact with people. Perhaps the most noticeable impression of this area will be the sound of dripping water into the tables.

2. Space Requirements: sufficient to accomodate 3 tables for phase I. Tables will be approximately 4' X 8' with access from all four sides. The space must be roofed but could be left relatively open on the sides. Security when the building is closed should be considered if it is open. Service from the exterior is important. A wide entrance large enough for a jeep is ideal.

3. Special Finishes: The floor is ideally covered with a grid of wooden slats. Sufficient drains should be provided in a subfloor of polished concrete-perhaps gutters on a module, with open drains to the exterior of the building. Care should be taken to leave no more than 1/4" between slats.

4. Special Furnishings: The water tables are ideally of wood structure (redwood) covered with fiberglas. They should be 4' X 8' X 8" deep waist high (36") and allowance should be made for reservoirs at a level under the principal pan top.

5. Utilities:

   a) Running salt water: preferably in troughs on a modular grid above head height.

   b) Fresh water sink in area: hot and cold.

   c) Electricity: 110-220 V distribution from ceiling

   d) Lights: located above tables as well as general area lights. Possibly sky-lights over some of the tables.

   e) Air Conditioning: not necessary but might be desirable in the future.

B. Wet Laboratories (Teaching):

1. Location: Preferably within sight of watertable area.

2. Space requirements: Provision for 20 students; 2 students per table 7' X 2'-6". Include a teaching space for professor. Room should be able to be darkened for showing films or slides.

3. Special finishes: Wood slat floor over concrete sub floor. Adequate drain system similar to watertable area.

4. Special furnishings: Provide for shelves on walls. There should be a counter at side of rooms with sink and utility service above. Blackboard and tackboards at front of room.

5. Utilities:

a) Fresh water, hot and cold, at sink in counter.

b) Possible salt water in future.

c) Electricity 110 and 220 V at counter

d) Gas at counter.

e) Compressed air at counter.

f) Electric distribution at ceiling for use at worktables.

g) Air conditioning.

C. Wet Laboratories (Research):

1. Location: Near wet table area and as close to faculty offices as possible.

2. Space requirements: approximately 20' X 20' per lab, and planned for maximum utilization of space and flexibility.

3. Special furnishings: There should be a work counter on one side of the space with utilities above. The sink should be located on one side of the counter-not in the center

4. Utilities:

a) Fresh water at sink, hot and cold.

b) Running salt water trough.

c) Compressed air

d) Gas

e) Vacuum

f) Electricity 110-220 V on counter. Power distribution at ceiling for use in center of space.

g) Air conditioning.

D. Dry Laboratories (Research):

1. Location: Near offices of faculty but not necessary to overlook watertable area.

2. Space requirements: Approximately 20' X 20' per lab and planned for maximum utilization of space and flexibility.

3. Special finishes: Floor of resilient material (vinyl asbestos)

4. Special furnishings: Provide a work counter at one side with utilities similar to wet research laboratories.

5. Utilities:

   a) Fresh water at sink; hot and cold.

   b) 110-220 V outlets at counter and power distribution at ceiling.

   c) Vacuum at counter.

   d) Compressed air

   e) Gas

   f) Air conditioning

E. Classrooms:

1. Location: Near other teaching spaces.

2. Space requirements: Space for 20 students sitting in individual chair with arm tables. The space should be able to be darkened for showing films and slides.

3. Special finishes: Flooring of resilient material (vinyl asbestos)

4. Special furnishings: Provide blackboard and tackboards.

5. Utilities:

   a) Elec. 110 V for audio-visual equipment and maintenance only.

F. Library:

1. Location: Near offices and administration area.

2. Space requirements: An area of approximately 20' X 40' for Phase I, to be duplicated in Phase II. The space should be designed with reading areas, card index files, stacks, periodical shelves, chart and map section, microfilm reader area, and any other use commonly found in a scientific library.

3. Special finishes: Floor of vinyl asbestos or rug for minimum sound reflection.

G. Administration:

1. Location: As close as possible to the main entrance of building and within easy distance of faculty offices.

2. Space requirements.

a) Directors office: 10' X 15' preferably with view.

b) Secretary and file space: 2 secretaries maximum, approximately 10' X 15'

c) Conference room: space for faculty meetings (25 max.) with a table for 12 people. This space must be able to be darkened. Provide wall space for charts, etc.

d) Pantry area: Adjoining conference room and director's office, and within easy access from faculty offices.

H. Faculty Offices:

To be located as close as possible to the labs and within easy walking distance of administration area. An area of approximately 10' X 10' should be provided for each professor.

I. Graduate Students:

1. Location: Near teaching and lab spaces

2. Space requirements: 2 students per cubicle of approximately 10' X 10' area. Best that the space be a large open area which can be subdivided into cubicles as needed.

J. Toilet and Washroom Areas:

To be located where convenient for all faculty and students. Keep in mind that the ratio of men to women in building will be 3:1. Provide a private toilet space for administration if possible.

K. Public Exhibit Area:

If possible, provide for some large aquaria in a centrally located space for public exhibits.

CONDENSED CHART OF SPACE REQUIREMENTS

Space	Size	Area Sq. Ft.	Phase I Area	Phase II Area	Phase III Area	Total Area
1. Watertables	8 X 4 tables	150 s.f./table	8 table X 150 1200 s.f.		8 tables X 150 1200 s.f.	16 tables X 150 2400 s
2. Wet lab (teaching)	20 students	20 X 30 600 s.f.	1 lab X 600 600 s.f.		2 labs X 600 1200 s. f.	3 lab X 600 1800 s.
3. Wet lab (research)	20 X 20	400 s.f.		3 labs X 400 1200 s.f.	3 labs X 400 1200 s. f.	6 labs X 400 2400 s.
4. Dry labs	20 X 20	400 s.f.		4 labs X 400 1600 s.f.	8 labs X 400 3200 s.f.	12 labs X 400 4800 s.
5. Classrooms	20 students	20 X 25 500 s.f.	2 rms X 500 1000 s.f.		2 rms X 500 1000 s.f.	4 rms X 500 2000 s
6. Library	20 X 40	800 s.f.	800 s.f.		800 s.f.	1600 s.
7. Administration	700 s.f.	700 s.f.	700 s.f.			700 s.
8. Offices (Faculty)	10 X 10	100 s.f.		10 of X 100 1000 s.f.	15 of X 100 1500 s.f.	25 of X100 2500 s.f
9. Offices (Graduate Students	10 X 7.5	75 s.f.		15 of.X 75 1125 s.f.	35 of X 75 2625 s.f.	50 of. X 75 3750 s.
10. Toilets & Restrooms	300 s. f.	300 s.f.	150 s.f.		150 s.f.	300 s.f
11. Public Exhibit Areas	400 s.f.	400 s.f.	400 s.f.			400 s.f
Sub totals			4850 s.f.	4925 s.f.	12875 s.f.	22650 s.f
12. Circulation and Mechanical Spaces at 25% of Net Area			1212 s.f.	1231 s.f.	3218 s.f.	5661 s.f.
Totals			6062 s.f.	6156 s.f.	16093 s.f.	28311 s.f.

Total Cost of Building $ 705,606.00

Apéndice 9

Cursos del Programa

CURSOS OFRECIDOS POR EL DEPARTAMENTO DE CIENCIAS MARINAS

*Cursos Sometidos para Aprobación

CM 553 BIOLOGIA PESQUERA. Tres créditos. Tres conferencias por semana.

Estudios de los principios y métodos de investigación pesquera, con énfasis en la pesquería de Norte América y el Caribe. Excursiones. TING.

CM 595 ECOLOGIA MARINA. Seis créditos. Diez horas de conferencias y dieciocho horas de laboratorio semanales durante seis semanas en verano.

Estudio de las comunidades marinas y su medio ambiente, con particular énfasis en el ecosistema. CERAME-VIVAS

CM 601 GEOMORFOLOGIA DE COSTAS. Tres créditos. Dos conferencias y un laboratorio de tres horas por semana.

Examen del origen de las características costaneras y sus relaciones con problemas costaneros relacionados con las ciencias básicas. Presentación de las fuerzas que modifican la costa. Excursiones. ZEIGLER

CM 605 GEOLOGIA DE LAS CUENCAS OCEANICAS. Tres créditos. Tres conferencias por semana.

El estudio de las cuencas oceánicas y teorías con respecto a su origen. Formaciones tales como cañones, guyots y cordilleras centro-oceánicas. Sedimentación marina y la relación entre los sedimentos y el ambiente. Se evaluarán métodos y técnicas de investigación oceánica. ZEIGLER

CM 606 OCEANOGRAFIA DINAMICA I. Tres horas crédito. Tres horas de conferencia semanales.

Introducción a los procesos dinámicos del mar. Ejes geopotenciales, cinemáticas Lagrangiana y Euleriana, expansión Euleriana, ecuaciones de continuidad, circulación y vorticidad, ecuaciones Navier-Stokes, estabilidad vertical, movimiento inercial, efecto de Coriolis, movimiento geostrófico, difusión y procesos de turbulencia, y movimiento Ekman.

CM 607 OCEANOGRAFIA DINAMICA II. Tres horas crédito. Tres horas de conferencia semanales.

Teoría de ondas de amplitud pequeña, aproximaciones en aguas llanas y profundas, resonancia en cuencas abiertas y cerradas, ondas internas. GIESE

CM 608 TECNICAS OCEANOGRAFICAS. Tres horas crédito. Tres horas de conferencia y doce horas de laboratorio a la semana, además de un crucero de una semana aproximadamente.

Entrenamiento en el manejo de técnicas y laboratorios de abordo para oceanografía física, química, geológica y biológica. Planificación y ejecución de crucero; obtención de data, procesamiento y análisis. ATWOOD

CM 611 PROCESOS LITORALES. Tres créditos. Tres conferencias por semana.

Movimiento de fluídos, olas y corrientes y la manera en que actúan afectando los sedimentos y la orilla. Teoría de olas linearizadas, marullos, resaca, morfología de playas, propiedades de masa y características de sedimentos, circulación intersticial, perfiles de equilibrio, transportación costanera de sedimentos y entre costa y mar, cambios de temporada y tormenta, circulación litoral. GIESE

*CM 618 HIDRODINAMICA DEL OCEANO. Tres créditos. Tres conferencias por semana.

Coordinadas geopotenciales, cinemática Lagrangiana y Euleriana, expansión Euleriana, ecuación de continuidad, ecuación Navier-Stokes, estabilidad vertical, el efecto de Corialis, corrientes geostróficas, corrientes inerciales, corrientes Ekman, procesos turbulentos y de difusión, teoría de ondas linearizadas y resonancia en cuencas abiertas y cerradas. GIESE

*CM 619 A, B, C, TEMAS ESPECIALES EN OCEANOGRAFIA FISICA. Uno a tres créditos. Una a tres reuniones por semana.

Tópicos especiales en oceanografía física, por acuerdo. GIESE

CM 621-622 CIENCIAS MARINAS. Cuatro créditos por semestre. Tres conferencias y laboratorio de tres horas por semana.

Presentación, demostración, trabajo de campo y laboratorio sobre los conceptos universales de las ciencias del mar. Se establecerán estos conceptos a base de los trabajos clásicos y su comprobación a través de adelantos recientes y la tecnología moderna. Incluye aspectos físicos, químicos, geológicos y biológicos del mar. FACULTAD.

CM 625 MICROBIOLOGIA MARINA. Tres créditos. Dos conferencias y un laboratorio de tres horas a la semana. (Cinco horas de conferencia y nueve horas de laboratorio a la semana durante el verano).

El estudio de la biología de las microalgas, bacterias y protozoarios marinos, con énfasis a las técnicas de cultivos puros y a la fisiología y ecología de organismos marinos tanto autotrofos como heterótrofos. BURKHOLDER

CM 628 OCEANOGRAFIA QUIMICA. Tres créditos. Tres horas de conferencia, a la semana. El estudio de la geoquímica y la historia geoquímica del mar y de los sedimentos marinos. Discusión sobre los componentes mayores y menores del agua de mar, sus variaciones, su distribución y su química analítica. Interacciones químicas entre la hidrosfera, litosfera, atmósfera y biosfera. ATWOOD

CM 629 LABORATORIO DE OCEANOGRAFIA QUIMICA. Tres créditos. 1 hora de conferencia y 6 horas de laboratorio a la semana.

CM 631 FISIOLOGIA MARINA. Tres créditos. Tres conferencias por semana.

Los procesos fisiológicos, al nivel de célula y organismo, directamente rela-

cionados con las adaptaciones de los organismos a los aspectos químicos y físicos del ambiente marino. Incluye aspectos específicos sobre los procesos fisiológicos envueltos en el estudio del desarrollo y comportamiento de organismos marinos. TOSTESON.

CM 632 LABORATORIO DE FISIOLOGIA MARINA. Uno o dos créditos. Tres o seis horas de laboratorio por semana.

Trabajo de laboratorio investigando un aspecto específico de un proceso fisiológico ante el ambiente marino. Tema por acuerdo. En conjunto con CM 631. TOSTESON

CM 635 BIOGEOGRAFIA MARINA. Tres créditos. Tres conferencias por semana.

El estudio del origen, especiación y distribución de plantas y animales marinos en relación a las características físicas, químicas y fisiológicas del mar. Enfasis especial en las biotas tropicales. CERAME-VIVAS.

CM 637 TEMAS ESPECIALES EN OCEANOGRAFIA QUIMICA. Uno a tres créditos.

Estudio tutorial de problemas específicos en la oceanografía química. Los tópicos serán seleccionados por acuerdo entre el estudiante y el profesor.

*CM 638 TEMAS ESPECIALES EN ECOLOGIA FISIOLOGICA. Tres créditos. Tres reuniones por semana.

Las bases fisiológicas de adaptaciones ecológicos a base de ejemplos representativos. Proyectos de investigación individual serán requeridos de cada estudiante. MADDUX

*CM 640 A. B. TEMAS ESPECIALES EN FISIOLOGIA MARINA. Tres créditos. Una conferencia y dos laboratorios por semana.

Cursos que utilizan técnicas de laboratorio especializadas en relación con problemas tales como regulación osmótica, equilibrio iónico y fisiología de pigmentos. TOSTESON

CM 641 ACUACULTURA. Cuatro horas crédito. Tres horas de conferencia y un laboratorio de tres horas semanales.

Estudio de los principios fundamentales de la producción de alimento mediante la utilización eficiente de ambientes y organismos acuáticos. Se incluyen ambientes de aguas saladas, salobres y dulces y los sistemas lóticos y lénticos en cultivo de peces y otros organismos acuáticos; tales como algas, moluscos y crustáceos.

CM 642 TEMAS ESPECIALES EN ACUACULTURA. Uno a tres horas crédito. Uno a tres horas semanales.

Estudio tutorial de problemas específicos en la acuacultura. Los temas serán seleccionados por acuerdo entre el estudiante y el profesor.

*CM 646 MORFOLOGIA DE INVERTEBRADOS MARINOS. Tres créditos. Dos conferencias y un laboratorio por semana.

Forma, estructura y función de invertebrados marinos representativos. CUTRESS

*CM 647 A.B.C. TEMAS ESPECIALES EN INVERTEBRADOS MARINOS. Uno a tres créditos. Una a tres reuniones por semana.

Estudio tutorial ó investigación sobre algún aspecto específico de invertebrados marinos o alguna técnica particular del estudio de éstas. CUTRESS.

*CM 648 EMBRIOLOGIA DE INVERTEBRADOS MARINOS. Tres créditos. Tres conferencias y/o laboratorio por semana.

El desarrollo de los invertebrados marinos, desde fecundación y segmentación a través de etapas larvales, hasta el adulto. Las relaciones filogenéticas de los grupos a base de su embriología. Cultivos en el laboratorio. CERAME-VIVAS.

CM 652 OCEANOGRAFIA BIOLOGICA. Tres créditos. Dos conferencias y un laboratorio por semana.

La vida marina en relación con los fenómenos geológicos, físicos y químicos del mar. Enfasis especial en las técnicas de laboratorio fundamentales al estudio del océano. Demostraciones y excursiones. GONZALEZ.

*CM 653 A. B. C. TEMAS ESPECIALES EN BIOLOGIA PESQUERA. Uno a tres créditos. Una a tres reuniones por semana.

Estudio individual sobre la biología o pesquería de peces ó invertebrados de importancia comercial. TING.

*CM 658 SISTEMATICA DE INVERTEBRADOS MARINOS. Tres créditos. Cinco conferencias y nueve horas de laboratorio por semana durante el verano.

Taxonomía, filogenia y distribución de invertebrados marinos, con especial interés en las formas locales. CUTRESS.

CM 661 BOTANICA MARINA. Tres créditos. Dos conferencias y un laboratorio por semana.

La flora del mar con especial interés a la morfología, ecología y taxonomía de las algas marinas. Excursiones. ALMODOVAR.

*CM 662 A.B.C. TEMAS ESPECIALES EN FICOLOGIA MARINA. Uno a tres créditos. Una a tres reuniones por semana.

Investigación individual sobre algún aspecto de las algas marinas de Puerto Rico. ALMODOVAR.

*CM 664 ICTIOLOGIA I. Tres créditos. Dos conferencias y un laboratorio por semana.

Morfología, fisiología y ecología de peces marinos. EGER.

*CM 665 ICTIOLOGIA II. Tres créditos. Dos conferencias y un laboratorio por semana.

La sistemática, evolución y distribución de peces marinos. EGER.

*CM 666 A.B.C. TEMAS ESPECIALES EN ICTIOLOGIA. Uno a tres créditos. Una a tres reuniones por semana.

Estudio o investigación individual sobre peces marinos. EGER

*CM 668 FISIOLOGIA DE PIGMENTOS . Tres créditos. Tres conferencias por semana.

Función fisiológica de pigmentos marinos. TOSTESON

CM 671 METODOS INSTRUMENTALES EN CIENCIAS MARINAS. Tres créditos. Dos conferencias y un laboratorio por semana.

Principios de medida, consideraciones generales y familiarización con las técnicas e instrumentos utilizados en oceanografía y ciencias marinas. MADDUX

CM 681 ECOLOGIA DE COMUNIDADES MARINAS. Dos créditos. Dos conferencias por semana. (Seminario).

Composición y estructura cuantitativas de selectas agrupaciones marinas, y sus relaciones tróficas y energéticas . CERAME-VIVAS

CM 691-692 SEMINARIO GRADUADO. Un crédito por semestre. Una sesión por semana.

Discusión de temas recientes en las ciencias marinas y disciplinas relacionadas . Los estudiantes discutirán tópicos de sus especializaciones. FACULTAD.

CM 695 TEMAS ESPECIALES. Uno a tres créditos. Una a tres reuniones por semana.

Discusión tutorial y/o trabajo de biblioteca y laboratorio sobre un tema especial. FACULTAD.

CM 699 INVESTIGACION. Hasta seis créditos.

Hasta seis créditos pueden ser otorgados por la presentación y aceptación de la tesis. FACULTAD

Revised and Amplified Listing of Courses in Physical Oceanography

INTRODUCTION TO PHYSICAL OCEANOGRAPHY.

General introduction to the physical processes which take place in the sea. Physical properties of sea water, heat budget, water budget, temperature-salinity relationships, the thermocline and vertical stability, light in the sea, equations of motion, Coriolis effect, geostrophic motion general oceanic circulation, waves and tides.

DYNAMICAL OCEANOGRAPHY (MA SC 618). Three credits. Three lectures per week. Prerequisites: MA SC 621-622, MATH 121-122, and PHYS 215, or equivalents; or permission of instructor. Spring semester, alternate years. Next offered 1969-1970.

Introduction to dynamical processes in the sea. Geopotential axes, Lagrangian and Eulerian kinematics, Eulerian expansion, equation of continuity, circulation and vorticity, Navier-Stokes equations, vertical stability, inertial motion, Coriolis effect, geostrophic motion, diffusion and turbulent processes, Ekman motion, small amplitude wave theory, open and closed basin resonance.

COASTAL OCEANOGRAPHY (MA SC 611). Three credits. Three lectures per week. Prerequisites: MA SC 621-622, MATH 121-122, and PHYS 215, or equivalents; or permission of instructor. Spring semester, alternate years. Next offered 1970-1971.

Interactions between long and short period waves and the shore. Tides, storm surges, seiches, shoaling wave theories, wave refraction and diffraction, breakers, run-up, longshore currents, nearshore sediment transportation, foreshore processes.

SPECIAL PROBLEMS IN PHYSICAL OCEANOGRAPHY. A.B.C. (MA SC 619). One to three credits. One to three sessions per week. Prerequisites: advanced graduate standing and permission of instructor.

Selected topics in physical oceanography.

Apéndice 10

Resumen de Facilidades

Apéndice 10

Resúmen de Facilidades

Status	Isla de Magueyes	Recinto
Existente	Edificio de laboratorio de 3,000 pies cuadrados que incluye oficinas administrativas, salones de clase y almacenes.	Edificio de 3,300 pies cuadrados para oficinas administrativas, biblioteca, oficinas y laboratorios para claustrales y cuarto oscuro.
Existente	Edificio de laboratorio de 2,430 pies cuadrados con espacios para estudiantes y sistema de acuarios y agua de mar corriente.	
Existente	Edificio dormitorio de 1,344 pies cuadrados con facilidades de comedor, cocina y laundry	
Existente	Edificio museo de 1,376 pies cuadrados.	
Existente	Edificio de talleres de 1,195 pies cuadrados con facilidades para trabajo de carpintería, electricidad, soldadura, mecáncia, plomería y almacén.	
Existente	Edificio residencia para el director de mantenimiento de Magueyes, 620 pies cuadrados.	
Existente	Muelle en forma de L, 153' x 10' y 31' x 10', con agua, facilidades eléctricas y mareógrafo.	
Existente	Muelle 114' x 5' para embarcaciones pequeñas.	

Status		
Existente	Camaronero rastreador, 53' manga, 18' eslora 8' calado, equipado para trabajo costero.	
Aprobado y Programado	Edificio de 23,311 pies cuadrados con facilidades de acuario y agua de mar corriente, laboratorio docente con agua de mar corriente, salones de clase, biblioteca, espacios administrativos y de exhibiciones, oficinas-laboratorios para facultad y espacios para estudiantes graduados.	11,217 pies cuadrados del edificio de Física-Geología y Ciencias Marinas, con un laboratorio mayor, oficinas-laboratorio para facultad, oficinas administrativas, espacio para estudiantes, salones de clase y conferencia, biblioteca, salón de dibujo, taller de instrumento, cuarto oscuro, cuarto congelador, almacenes.
Propuesto	Nave de Investigaciones Oceanográficas, 90 pies de manga	
Propuesto	Muelle y talleres.	
Proupuesto	4,000 pies cuadrados de facilidades de residencia para investigadores visitantes y estudiantes.	

Apéndice II

Documentación sobre la nueva embarcación del Departamento de Ciencias Marinas

COMMERCIAL AND YACHT
CONSTRUCTION
GENERAL MARINE
REPAIR SERVICE
100 TON CAPACITY

Rockport Yacht & Supply Co., Inc.
A Subsidiary of Luling Oil and Gas Company, Inc.
P. O. Box 662
Rockport, Texas 78382

AREA CODE 512
SOUTHFIELD 4-2274
SOUTHFIELD 4-5431

August 20, 1968

Dr. Graham S. Giese
University of Puerto Rico
Department of Marine Sciences
Mayaguez, PUERTO RICO 00709

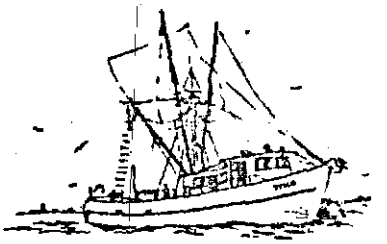
Dear Dr.Giese,

We propose to build for you a 90' x 23' x 9'5" steel twin screw vessel to be used for research purposes. The vessel to be built in accordance with the general scantlings and equipment specifications enclosed. The vessel will be powered with 2 - D 343 TA Caterpillar engines, equipped in accordance with B. D. Holt Company quotation, and also to be equipped with 30 KW diesel driven 110/220 volt AC generator and panel.

The vessel is to be similar to size and configuration to the M/V "CARRY BACK" which was observed by you and Captain Felix on the occasion of your visit to Rockport.

The price of the vessel, afloat Rockport, Texas is estimated to be $232,000, less all winches and hydraulic package. Prices on winches and hydraulic package will be furnished to you as soon as we receive it from the manufacturers. Note should be taken that this quotation includes an allowance of $20,000 for electronics. Price will be adjusted upward or downward in accordance with the actual cost of equipment and installation of your selection. The price also includes gallows and 'A' frame, and dual stations controls.

Above estimated price shall remain firm for 120 days from this date, and may be extended on approval by Rockport Yacht & Supply Co., Inc. The price quoted on profiles and other drawings outlined in specifications are included in the estimated price if Rockport Yacht & Supply Co., Inc., are the builders of the boat for your account.



COMMERCIAL AND YACHT
CONSTRUCTION
GENERAL MARINE
REPAIR SERVICE
100 TON CAPACITY

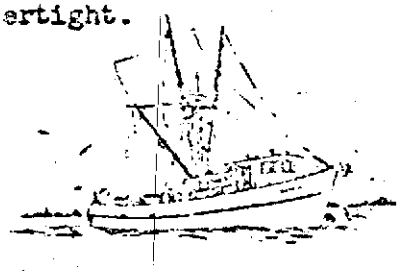
Rockport Yacht & Supply Co., Inc.
A Subsidiary of Lakey Oil and Gas Company, Inc.
P. O. Box 552
Rockport, Texas 78382

AREA CODE 512
SOUTHFIELD 4-2274
SOUTHFIELD 4-5431

SPECIFICATIONS STAND BY BOAT 90' X 23' X 9'5" APPROX.

BUILT BY: ROCKPORT YACHT & SUPPLY CO., INC.
ROCKPORT, TEXAS

Keel .....3/4" x 12"
Mold Frames.....5/16 x 3" x 4" L on approximately 72" centers
Intermediate Frames.....1/2" x 4" flat bar, approximately 18" centers
Floors.....1/4" PL - 18" deep
Deck Beams.....5/16" x 3" x 4" angle
Chine Gussetts.....5/16" plate
Bulkheads, tanks
baffles, etc.....1/4" PL with 1/2" x 3" x 3" L.
Stiffeners.....All tanks to be fitted with manholes, tanks to be baffled. Welded inside and outside.
Bulwarks.....5/16" plate set 1 1/2" inboard and capped with 2 1/2" pipe guard rail
Rubrail.....Formed 6" of 5/16" plate
Standard Anchor Roller
House .....3/16" plate, insulated and paneled with pre-finished plywood, fitted with a water tight door, and fixed windows
Tail Shafts.....4" Cold rolled steel
Stub Shafts.....4" Cold rolled with Dodge Sleevoil bearing one (1) on each shaft.
Rudders.....Two (2) 3/8 PL and 3" stock of cold rolled steel
Stern Tube.....Schedule 120 pipe complete with packing gland and cutless bearing
Engine Bed.....Of 6" x 6" x 1/2 L with 5/16 x 3" x 4" braces.
Crash Bulkhead Fwd. front and rear engine room, bulkheads, all water tight.
Forward and lazarette hatches.
Keel cooling - Channel Iron.
POWER.....Reference letter 8/20/68.
ELECTRONICS.....Reference letter 8/20/68.
Fuel.....Fuel Capacity - 7,000 gallons approximate - tanks to be fitted with sight guage.
Lube Oil Tank - Approximate 175 gallons - fitted with sight guage.
DeckHouse & Forepeak.....To be air conditioned. Upper house, or wheelhouse, constructed of 10 gags ceiled with Marlite, two (2) wooden doors, fixed windows. Lower house constructed of 3/16 ceiled with Blonde Mahogany prefinished. All windows fixed rear door watertight.



A specimen contract and warranty is included for your information.

We wish to thank you for visiting our yard, and for giving us the opportunity of presenting this proposal for your consideration.

Very truly yours,

ROCKPORT YACHT & SUPPLY COMPANY, INC.

John P. Mitchell, Jr.
Vice President

JPM,Jr/wa

Enc. Specifications
Contract
B. D. Holt Quotation

FLOORS:.....All floors vinyl floor covering or Torganol.

Below deck accommodation for six (6) berths, compartment to be ceiled with 1/4" plywood. Floor painted with non skid epoxy.

Cabin to have two (2) double staterooms - two (2) wash rooms.

Galley and dinette.

Lab on deck to be finished similar to "WESTERN GULF" and approximately 16' x 20'.

Below deck area to have one (1) compartment for lab use and one (1) compartment for electronics.

EQUIPMENT:

600 ft. 5/8 galv. cable
One (1) 50R Northill (modified)
Three (3) 2" Marlow Electric Pumps (ballast & fuel)
One (1) Electric "Tulsa" or "Blume" anchor winch
Two (2) Commodes
Two (2) Lavatories
One (1) Shower
Two (2) 15 lb. CO_2 Fire Extinguishers
One (1) 5 lb. CO_2 Fire Extinguisher
Fifteen (15) Life preservers - Balsa
Two (2) 30" Plastic ring buoys - w/brackets
One (1) One Mile Ray searchlight
Two (2) 4-blade propellers Federal PT bronze prop.
One (1) 40" Steering wheel - steering standard transmission.
Twelve (12) Innerspring mattresses
Electric Range - four (4) burner with oven
One (1) Philco freezer 12 cu. ft. approximate
One (1) Philco refrigerator 12 cu. ft. approximate
Two (2) 1/3 H.P. pressure systems
One (1) 5" Constellation Compass w/compensating spheres - compass not compensated.

MAIN DECK ACCOMMODATIONS:

The deck house will be extended aft for a distance of approximately 20' this area will be used as laboratory and will be similar in arrangement and finish to the "WESTERN GULF". The deck house area now used as a lounge will be used for two (2) double staterooms, a double washroom, a dinette lounge and a galley.

WHEELHOUSE: Wheelhouse will be same as "CARRY BACK" but will be fitted with two (2) bunks.

BELOW DECK AREA: Below deck accommodations will be such that six (6) men will be accommodated. A washroom will be made available in this area. Aft of this will be a passage way with a lab on one side and an electronics lab on the other.

All panelling in all areas will be Blondo Mahogany and all floor covering will be DAP over steel.

PROFILE AND ARRANGEMENTS

Outboard profile, inboard profile and preliminary engine room layout will be made available to the buyers for the sum of $7,500.00 (U.S.) which will be considered part of the actual bid price, etc.

Drafting and engineering will be done in excess of the above on an hourly basis drafting at the rate of $10.00 and engineering at $15.00 per hour.

ROCKPORT YACHT & SUPPLY CO., INC.

Apêndice 12

Seminarios

Seminars
1967

January 10. Dr. Donald M. Ross. Dean of Faculty of Arts and Sciences, University of Alberta, while a visiting investigator at the Institute's field station, La Parguera, showed color movies and lectured on the "Association of the sea anemone Calliactis parasitica with pagurid crabs, Dardanus arrosor and Pagurus berbardus."

February 16. Miss Nancy Cramer, a pre-doctoral fellow at the Smithsonian Institution, gave a seminar on "Coral inhabiting polychaetes" at the field station where she was a visiting investigator.

March 20. Dr. Ruth Turner, Malacologist, Museum of Comparative Zoology, Harvard University, lectured on "Teredos and deep-water testing" at the field station where she was doing research on larval forms of teredos.

March 30. Dr. Claude E. ZoBell, Professor at Scripps Institution of Oceanography, University of California, La Jolla, gave a seminar on campus, "The importance of bacteria as geochemical agents".

May 2-4 Dr. Francis G. Stehli, Director, Department of Geology, Western Reserve University, gave a series of conferences on 1) "Ecological models in geology", 2) "Paleoecological test of hypothesis of an axial-dipolar earth magnetic field", and 3) "Carbonate sedimentation: Biogeochemistry in action".

1963

January 4 Dr. Ruth D. Turner, Museum of Comparative Zoology, Harvard University, and Dr. Fred Rosenberg, Northeastern University: "The biology of shipworms (Teredinidae) of La Parguera".

January 19 Dr. Jonathan Wittenberg, Albert Einstein, College of Medicine: "Swimbladders".

February 9 Dr. Sven O. Ebbesson, Perinatal Physiology Laboratory, National Institutes of Health: "Organization of the shark visual system".

February 23 Dr. John M. Dean, Batelle-Northwest Pacific Northwest Laboratory, Washington: "Temperature effects on aquatic organisms".

March 8 Dr. Harold Barnes, The Marine Station, Millport, Scotland: "Balanus balanoides: a boreo-artic species".

March 14 Dr. Eric Davidson, Rockefeller University: "Cogenesis and early development".

March 21 Drs. Halsey Marsden and Steve Vessy, National Institutes of Health: "The ecology of Monkey Island, La Cueva, Parguera".

March 26 Dr. Francis G. Carey, Woods Hole Oceanographic Institution: "Warm-blooded tuna".

April 10 Dr. Don Sasscer, Centro Nuclear, Mayaguez: "Nuclear Engineering at the University of Puerto Rico".

April 25 Dr. Howard Winn, Graduate School of Oceanography, University of Rhode Island: "Sound production in the toadfish (Opsanus tau)".

May 9 Dr. Gustavo Candelas, Department of Biology, U. P. R., Rio Piedras: "The Mangrove".

June 20 Dr. Thomas S. Austin, National Oceanographic Data Center, Washington, D. C. "The National Oceanographic Data Center."

August 29 Mr. Frank Wadsworth, Institute of Tropical Forestry, U.S.D.A. Forest Service: "The Biology of Mona Island".

September 5 Mr. D. Clay McDowell, University of Puerto Rico, Rio Piedras, P.R. "Tropical Hurricanes".

September 12 Dr. Paul R. Burkholder, Lamont Geological Observatory, University of Columbia: "Some Recent Research in Marine Biology".

September 19 Dr. Frank Lowman, Puerto Rico Nuclear Center, Mayaguez, P. R.: "Trace element studies in Puerto Rico and Panama".

October 3 Dr. Antonio Santiago Vázquez, Department of Civil Engineering, Water Resources Institute of Puerto Rico, CAAM: "Water Resources of Puerto Rico".

October 10 Dr. Nelson Biaggi, Medical Sciences Precinct, University of Puerto Rico: "Environmental Pollution".

October 17 Mr. Reginald Briggs, U.S. Geological Survey, San Juan, Puerto Rico: "Geology of Puerto Rico".

October 24 Dr. Kenneth Read, Department of Biology, Boston University: "New England Marine Fauna".

October 31 Miss Joan Allwein, Univeritetets Zoologiske Museum, Copenhagen, Denmark: "General Considerations on Marine Hydrozoa".

November 7 Mr. Sergio Camero, Puerto Rico Economic Development Administration: "The Role of the Sea in Puerto Rico's Economic Development".

November 14 Dr. Waldemar Adam, Department of Chemistry, University of Puerto Rico, Rio Piedras: "Free Radicals in Sea Water".

November 21 Dr. Donald M. Ross, Faculty of Science, University of Alberta, Edmonton, Alberta, Canada: "Attraction and Repulsion in Sea Anemone Behavior".

December 5 Dr. Howard Sanders, Woods Hole Oceanographic Institution, Woods Hole, Mass.: "Some Aspects of Benthic Ecology".

1969

January 23 Dr. W.D. McElroy, Dr. J.W. Carpenter, The McCollum Pratt Institute, Johns Hopkins University: " Luminescent Bays".

February 6 Dr. Daniel C. Tosteson, Department of Physiology, Duke University, Durham, North Carolina: "Some Aspects of Membrane Physiology".

April 24 Dr. Frank G. Lowman, Marine Biology Programs, Puerto Rico Nuclear Center: " The Mangrove Irradiation Project".

June 19 Prof. G. Fred Lee, University of Wisconsin, Water Chemistry Laboratory, Madison, Wisconsin: "Eutrophication of Natural Waters".

June 25 Mr. Robert W. Brody, Graduate Student, Columbia University: "Ecology of Soft Corals in the Virgin Islands and Puerto Rico".

September 25 Capt. Waldemar Barnes, Ramey Air Force Base, Aguadilla, P.R.: "Hurricane Hunters".

October 2 Dr. William C. Forster, Nuclear Center, Mayaguez, P. R.: "Hanford radio activity and its effects in the Columbia River estuary and the adjacent North East Pacific Ocean".

October 16 Dr. John D. Weaver, Geology Department; "Some aspects of the Geology of Puerto Rico and problems of changing sea level".

October 23 Prof. José del Castillo, Dept. of Pharmacology, School of Medicine, San Juan, P. R.: "Special Problems in Marine Pharmacology and Physiology".

November 10 Prof. Henry Rapoport, Dept. of Chemistry, University of California, Berkeley, California: "Sirenin, the sex hormone of the water mold, Allomyces".

November 20 Dr. Alexander D. Acholonu, Associate Professor, Inter American University: "The Trematode Parasites of Turtles with some comments on those of Puerto Rican Sea Turtles".

December 4 Dr. Toro Goyco, Department of Pharmacology, Medical Sciences Campus, San Juan, P.R.: "Chemical Studies on the Toxin of Rypticus".

Apéndice 13

Lista de Lecturas

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