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THE AUSTRALIAN NATIONAL UNIVERSITY

RESEARCH SCHOOL OF BIOLOGICAL SCIENCES  
ANNUAL REPORT

PROFESSOR CATCHESIDE'S REPORT TO THE COUNCIL

The Annual Report of RSBS for 1968 (document 38/1969) is for the first year in which the School was reasonably operational. The School began to take shape during 1968, with laboratories and other facilities becoming available following completion of the conversion of Block M during the early months of the year. This building provides very reasonable facilities, but has also had to provide accommodation for administration, workshop and other facilities which had not been contemplated when the plans were formulated originally, but which it was soon found necessary for the School to have. Furthermore, the groups of research workers found the space available insufficient. Fortunately, the Research School of Chemistry has become host to one large section, Environmental Biology, and the John Curtin School of Medical Research continues to house Genetics and Molecular Biology. In my opinion the School should be able to manage reasonably well with what it has (a net area of about 21,000 sq. ft.) until the permanent building becomes available. While some of the accommodation is less in amount or less convenient than some would like, I do not believe that the shortcomings are such as will interfere with good work being done. I hope very much that the permanent building will not be delayed by any unforeseen difficulties, mainly because I would not like to incommode our Research School of Chemistry and John Curtin School of Medical Research hosts for any longer than is absolutely necessary, but also because it will be good for the health of the School to bring it together in one place.

Planning of the permanent building is proceeding satisfactorily. We have proceeded to the stage of sketch plans at the 1/8 inch to 1 foot scale and although some difficulties have been encountered in adjusting our needs to the shape of the building, (itself determined by restriction of the site), the stage reached this week has shown that the problems can be solved. Consequently, it is expected that sketch plans agreed by the Users will be presented to the Buildings and Grounds Committee in June. The consideration of the preliminary sketch plans is referred to in item 8 of Buildings and Grounds report (1596/1969) of meeting of 18 April, under tab. 11.

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11 July

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Two senior appointments were made in 1968. Dr G.A. Horridge, who is Director of the Gatty Marine Laboratory at St. Andrews University, accepted the Foundation Chair concerned with Behavioural Biology. He is well known for his research in neurobiology, especially with the nerve nets of lower animals. He visited Canberra for about a month from late February

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\* Commonwealth Postgraduate

to late March this year, to arrange for his laboratory and its equipment. The School was delighted to celebrate his election to Fellowship of the Royal Society, announced during his visit. He toured parts of Australia to investigate sources of material for his work. In the course of this tour he saw a good deal of the marine biology conducted in Australia and gave some advice about future developments. He will take up his appointment in August this year.

Dr Hiroto Naora, who was Chief of Biology Division, National Cancer Center Research Institute, Tokyo, accepted appointment to a Professorial Fellowship to develop a unit of Molecular Biology. He took up his appointment in October last and has begun work on the mechanisms of synthesis of nucleic acids and proteins. These are basic to all living systems.

When the School was conceived and started, it was intended that it would not be organised into separate departments, a notion which was at first accepted without comment or criticism. However, it was expected that there would be a very loose organisation principally directed to the solution of problems chosen in a few selected areas. Experience has shown that due to the need to give the Foundation Professors assurances of supporting staff (academic and non academic), they have acquired groups whose nature, function and relations are indistinguishable from conventional departments. Furthermore, there has had to be a sharing out of commodities in relatively restricted supply, such as funds for equipment and scholarships. Consequently the School is moving towards the acceptance of a structure like that in most other Schools of the Institute. It is therefore likely that the Board of the Institute will be asked to recommend to Council the establishment of departments, the shape of which is now clearly seen. This new structure will not change the work of the School or its objectives and we hope there will not be any diminution of interaction between the different parts of it. It seems that non-departmental Schools do not work here, so well as they do in the USA, where "professor" has a different connotation from ours.

To turn to a brief review of the research in the School, an indication of the activity is afforded by the fact that 35 papers based on work done in the School were published during the year. A few high lights in the work may be noted.

In Developmental Biology, Dr Pickett-Heaps has been engaged in some remarkable studies of the process of cell division using electron microscopy. Cells are the very small units of which plants and animals are built up. Many cells are able to grow and when they reach a critical size they divide by a very complicated process into two similar cells. Pickett-Heap's research, done with plant tissues and green algae, has disclosed details of the mechanics, including the participation and activities of ultramicroscopic constituents of the cell. The work has created a considerable stir abroad.

In Environmental Biology, a major interest is in the physics of exchange of energy, water and gases between organisms and their environment. Our environment (soil, atmosphere and natural waters) is a product of the activity of organisms over hundreds of millions of years and evidently there is a delicate balance, the fluxes and effects of which are the concern of Professor Slatyer, Dr Cowan, Dr Anderson and Dr Kenny. They have been given a considerable grant by the Australian Water Resources Research Council to aid one aspect of their study, that concerned with the water loss to the atmosphere by evaporation and especially by transpiration from plants.

/Dr Osmond....

Dr Osmond has continued to develop his work on the recently discovered second mechanism of photosynthesis, the process whereby green plants trap the energy of sunlight by fixing it in organic compounds. This newly discovered mechanism is more efficient and is found particularly in tropical grasses, such as maize, and in some salt bushes in our arid interior.

In Genetics, I will mention two pieces of research very briefly. Like all of the work in genetics, both are basic to biology. First, it appears that Dr Creaser and his associates will soon solve the structure of an enzyme, to the genetics of which we have devoted much effort. It seems that the difficulties are overcome essentially and that effective new methods have been evolved. Dr Doy and his associates have made considerable progress with a remarkable, and so far unique, situation in which one catalytic function in the synthesis of certain amino acids is conducted by each of three enzymes, so called isoenzymes because they are essentially equivalent. Each is determined by a different gene and each is differently subject to control of its activity by the ultimate products, the amino acids. This is one of the kinds of control mechanism which permit delicate balances within organisms.

Lastly, I would like to refer briefly to a small project by which the School hopes to aid a matter of general utility. It is nearly 200 years since Banks and Solander, carried in Cook's ship 'Endeavour', first discovered the botanical riches of Australia. It is more than 100 years since Bentham published in 7 volumes the only flora of the whole continent ever written. This is now seriously out of date and a modern flora is badly needed by a wide range of workers, including agriculturists, foresters, chemists interested in natural products and geographers. The CSIRO Divisions of Plant Industry and Land Research have pooled their resources of herbarium and taxonomic staff, while the School has appointed two fellows to work on principles, conduct research and supervise scholars in due course. These are contributions towards production of a modern flora. It is also an area in which CSIRO and ANU will cooperate and I expect that the University will shortly be offered facilities for active cooperation.

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DGC/HC:LJH

19 May 1969.

RESEARCH SCHOOL OF BIOLOGICAL SCIENCESANNUAL REPORTNotes on presentation to Council 9.v.1969

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D.G. Catcheside  
Director.