They're used as agricultural pesticides, in food preservation, and in such everyday products as petrol, paint, plastics and household pest strips.

But the time has come when he must consider reducing his dependence on them or run a risk of genetic damage that will increase with a snowballing effect from generation to generation.

This is the opinion of Dr Ken Dyer, who, as senior lecturer in genetics at Monash, has spent the last five years researching the possible mutagenic effects of a large number of organophosphorus compounds.

This year he received a $2338 grant from the Australian Research Grants Committee to continue his work. He will do this at the University of Adelaide where he has now gone to develop a new course in social biology.

At this stage of his investigation, Dyer sees a need for some type of government-controlled program aimed at systematically reducing the use of organophosphates in Australia over, say, a 10-year period. This would give time for non-hazardous substitutes to be developed and allow complete elimination of the most dangerous ones.

Working with graduate student Mr Peter Hanna, Dyer has tested nearly 150 organophosphorus compounds, both simple and complex, on bacteria and...

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Ph.D. student Peter Hanna (left) and Dr Ken Dyer with bottles of 'superflies' mutated to withstand massive doses of organophosphate insecticides.

There's a Drosophila in the ointment

Drosophila (vinegar fly). About 10 per cent of the compounds screened have proved to be mutagenic—that is, they cause permanent chemical changes in the genetic material DNA which can be passed on from generation to generation.

Common Drosophila mutations, such as stunted or curly wings, white eyes and abnormal body colors, have been induced.

Dyer and Hanna have paid particular attention to the effects of the compound dichlorvos (dichlorovinyl dimethyl phosphate—DDVP) which is used in household pest strips as well as agricultural pesticides.

Drosophila populations exposed to low doses of DDVP for some months have shown a significantly high frequency of potentially lethal mutations.

Other organophosphorus compounds which have also proved mutagenic include metasystox, which has been widely used as a systemic agricultural insecticide since 1950, thimeton (since 1952), vamidothion (1961) and primifos (1970).

The particular worry with many of the insecticides, says Dyer, is that they are widely used in spraying fruit and vegetables and protecting stored food products and grains.

Very simple phosphates, triethyl and trimethyl, have wide and important uses in the paint, plastics and chemical industries. The Dyer-Hanna research has shown that exposure to these more simple phosphorus compounds can also produce fly mutations which confer resistance to other, more complex ones.

The pair have developed Drosophila capable of tolerating close to 100 times the normal lethal dose of DDVP.

This means that unless their use is restricted and finally banned, organophosphorus insecticides will have to be used in dangerously high concentrations to remain effective.

And this in turn, will increase the danger to the human population.

While accepting that the chain of in...
Robert Blackwood Hall looks like becoming a home away from home for the Melbourne Symphony Orchestra this year.

After traditionally opening the annual series of free Monday lunchtime concerts on March 17, the MSO will make frequent returns to Monash in the following months.

Its appearances will be a highlight of another year of cultural thrust at the University: Robert Blackwood Hall and Alexander Theatre productions and a variety of art exhibitions.

The ABC will bring the MSO to the campus on May 6, June 4 and June 25 for the first of its two Gold Series concerts for 1975 and again for a family celebrity concert. It has also chosen Robert Blackwood Hall for its Dorian le Gallienne Memorial Concert.

The Hall, continuing its policy of presenting an annual series of concerts for schools, plans two and possibly three this year—again 'starring' the MSO. And as usual, there will also be a series of free Sunday afternoon concerts for staff, students and public. Five are planned and in addition this year there will be two on Wednesday evenings.

The Melbourne Chorale will present half their annual subscription series at Robert Blackwood Hall this year and the hall will stage two concerts in association with Musica Viva.

There will be 21 concerts this year in the Hall’s free Monday lunchtime series and—as in 1974—there will also be a number of light entertainment lunchtime shows.

Student productions are expected to be as varied as last year, ranging from rock, choral, pop and blues concerts to lectures and Malaysian music recitals, while puppet master Dale Woodward will entertain and instruct children with a week-long puppet workshop.

Another schools-oriented activity will be a week of Indonesian music and dance presented by Dr. Margaret Karotomi of the Monash Music Department.

The American drama 'The Rainmaker', by Richard Nash, opens at the Alexander on April 4 and will play there until April 19 before starting a three-week tour of country centres for the Victoria Division of the Arts Council of Australia. Next comes a two-week children's production during the May school holidays and the company then goes into rehearsal for repertory productions of 'Hamlet' (June 24-July 12) and 'Rosencrantz and Guildenstern Are Dead' (July 15-26). 'Rosencrantz, etc.' will return from August 19-23.

$22,500 in grants

Present plans are for another children's production during the August school holidays and a further adult production at the end of September.

The Alexander Theatre Company has been funded $10,000 this year by the Victorian Ministry for the Arts and $12,500 by the Australian Council for the Arts (of which $2,500 is for youth activities).

The theatre's 'Saturday Club' series of children's productions will be expanded this year to top the 1974 run of 16 different programs. This year's series will again aim at showing children the many facets of theatre, ranging from films to the Tinkooff Puppets to the Ballet Victoria.

Student productions at the Alexander will include two by the Monash Players and others by the Monash University Musical Theatre Company, Monash Student Theatre and the Modern Dance Group, while non-university groups have booked the theatre to stage five musical comedies.

Art works on show

More interest will be focused on the Monash art collection following the establishment of the department of Visual Arts under Professor Patrick McCaughey and the appointment of Mrs Grazia Gunn as the collection's first full-time curator.

A selection of about 40 works from the university’s 300 paintings and sculptures will be displayed from March 12-27 in the new Exhibitions Gallery—part of the Visual Arts Department on the 7th floor of the Menzies School of Humanities extension.

The gallery will also mount shows relevant to the new department's teaching and encourage exhibitions from outside. Cultural thrust?—This year it's more like a cultural revolution.
What a jewel of a discovery

Some people say opals are unlucky—but not electron microscope technician Bram Dawson, in the Monash department of Earth Sciences. He knows how to make them.

Dawson began work on the structure of the beautiful stones eight years ago while working in the CSIRO with Dr John Sanders, who first recognised the reason for color in precious opal. This led to a process of synthesising it.

Swift progress was made towards reproducing it in the laboratory but only recently has the process been sophisticated to a degree that it is now possible to pre-determine the synthetic color patterns.

‘I am still working in collaboration with CSIRO’s Division of Mineralogy and we hope the synthetic will one day be highly useful,’ says Dawson.

‘Synthetic opals will never replace the real thing. But like cultured pearls and artificial diamonds, rubies and sapphires, they will one day serve as a cheaper alternative for people who cannot afford the genuine article.’

One difficulty remains: a tendency of the synthetic opal to become friable (liable to crumble) after a time. Dawson says this flaw had also proved a drawback to the Pierre Gilson company of Switzerland, which recently announced its intention to market a synthetic opal.

Although he now spends only two or three hours a week on the project—‘more like a hobby’—Dawson has made considerable progress towards correcting this friability defect.

Some aspects of the manufacturing process are still on the secret list but basically it consists of precipitating a form of silica gel in a glass tube.

Over an average period of a few weeks, a thin layer of material showing a vivid display of colors settles on the bottom of the tube. This is the synthetic opal.

But of course there is more to it. Dawson says temperature control plays a critical part in the process and an electron microscope is vital as a means of ‘quality controlling’ the size of millions of individual silica spheres which go to make up the ‘gem’.

The microscope is also used to examine the packing of the uniformly-sized, amorphous spheres into ordered arrays. Dawson explains that diffraction of light by the spheres causes the play of color in precious opal.

As an indication of the delicate manipulations involved, Dawson explains that the spheres must be within the range of 1500-3600 Angstrom units in size to give color. (An Angstrom unit equals one ten-millionth of a millimetre.)

If there is little more than a two per cent variation in sphere size, the result is colorless opal potch.

Knowledge of this unique process, as revealed by the electron microscope, has also given new insight into how algae and other organic matter can so readily be fossilised in the silica of cherts (pieces of flint-like quartz). ‘With this in mind, we are now burying certain types of blue-green algae in a slightly alkaline silicious gel and, by slowly adding to the silica, creating “instant” fossils in the laboratory,’ says Dawson.

With the electron microscope, he has discovered single-cell fossils in cherts which could possibly date back to the very beginning of life on earth, somewhere about three billion years ago.

‘As we can now produce single-cell fossils in the laboratory in a matter of weeks, it would be rash to state definitely that those we have discovered occurring naturally date from any specific time,’ says Dawson. However both he and the chairman of Earth Sciences, Professor Bruce Hobbs, believe at least some are genuine fossils.

Industrial uses

The microscopic, uniformly-sized silica spheres Dawson can now produce also have industrial uses. He is already supplying them on a trial basis to several makers of scanning electron microscopes in Holland and the US who use them to test the capabilities of their focussing mechanisms.

Dawson is anticipating extending his studies when a new transmission electron microscope with built-in chemical analysis capabilities goes into operation in Earth Sciences.

‘The transmission electron microscope will be useful in determining minute elements in our specimens,’ he says. ‘We have studied opals from many parts of the world and hope that in the not too distant future we will be able to “fingerprint” where each “gem” comes from and determine its host environment.

‘We will also be able to tell whether a stone is genuine or fake—which could be extremely useful to the opal buyer of the future.’

Only the electron microscope, by magnifying thousands of times, can distinguish real opal (top) from the synthetic (bottom).
LOVE-HATE RELATIONSHIP

Lack of understanding between business graduates and their potential employers in private industry is robbing Australia of 'whizz kid' executives.

At least that's how Dr Russell Lansbury and Dr Peter Gilmour, of Monash's department of administrative studies, see the situation.

They compare the graduate and the practising businessman to 'unrequited lovers: both realise, deep down, that they need each other, but they require outside help in settling their differences'.

The two lecturers make their judgment after completing a pilot study of the attitudes of both sides to what they jokingly term 'how to succeed in business despite an education'.

The study is aimed at providing 'direction and methodology' for a much more intensive investigation, now in the planning stage.

While they concur on some points, there is generally marked disagreement between businessmen and graduates about the desirable qualities in a highly-educated management trainee, say Lansbury and Gilmour.

Undergraduates stress such things as 'ambition' and 'creativity' while businessmen dwell more enthusiastically on 'common sense' and 'willingness to receive directions'. These latter tend to downgrade the importance of the individual's contribution and limit his independence.

Graduates who have had a taste of working world realities differ yet again by giving more weight to 'communications' and 'political skills', which underwrite the importance of being able to adapt to the business environment.

The Lansbury-Gilmour research seeks a clue to the riddle of why only 24 per cent of first degree graduates in 1973 found jobs in private industry and commerce, despite the fact that this sector of the economy employs 75 per cent of the Australian workforce.

These worrying statistics, issued by the Graduate Careers Council of Australia, show that of the remainder 34 per cent went into teaching, 36 per cent took other government positions and six per cent entered professional and private practice.

Worsening situation

Those Australian graduates who did find employment in industry mainly joined large-scale organisations. Less than one per cent went on the payrolls of small establishments, though these account for the greater part of Australian business.

Instead of the situation showing signs of improvement, a check by the university's Careers and Appointments office on the job destinations of Monash graduates over recent years shows a definite trend AWAY from industry.

In 1968, some 40 per cent of economics graduates went to private enterprise, but by 1973 this had declined to 20 per cent. There were smaller—but still significant—drops in all other faculties.

Distinguished lawyer is third Chancellor

Sir Richard Eggleston has taken up duties as Monash's new Chancellor.

He becomes the third distinguished public figure to hold the position since the University's founding.

Sir Robert Blackwood, after whom Monash's great hall is named, was chairman of the Interim Council from 1958 to 1961 and subsequently served as Chancellor until 1969.

He was succeeded by Sir Douglas Menzies, who died in November, 1974.

Sir Richard Eggleston will hold office as Chancellor for the remainder of Sir Douglas Menzies' term, until March 1977.

The new Chancellor has a wide legal and academic background. He began practice as a barrister in 1932 after graduating with first class final honours from Queen's College, University of Melbourne, and took silk in 1950. He was treasurer and then chairman of the Victorian Bar Council between 1953 and 1958. He was appointed to the Bench of the Australian Industrial Court and the Supreme Court of the A.C.T. in 1951 and, later the same year became the Judge of the Supreme Court of Norfolk Island. In 1966 he became the first President of the Trade Practices Tribunal while continuing to hold his judicial appointments on the Industrial Court and the Supreme Court of the A.C.T.

On his retirement last year, Sir Richard accepted appointment as part-time lecturer in the Monash Law School, where he specialised in teaching and research in problems of proof, an area of the law in which he has long been interested. He has also given occasional lectures in other subjects during the academic year.