In 1965 a large part of the east coast of U.S.A., including New York City, suffered a black-out of several hours.

A disturbing though briefer failure occurred in the Victorian system in 1960: a fault in the interconnection between the Victorian and New South Wales systems, in the Snowy Mountains, caused a loss of supply for a couple of hours.

Such breakdowns are inconvenient and extremely expensive for both the power authorities and the community in general.

The particular difficulty with electricity in a modern system is that—unlike, say, factory made goods, or even water and gas systems—it is a product that cannot be ordered: it must be generated and delivered as the user wants it.

And the user wants four things:
1. An assured supply for ever, even though demand doubles every eight years or so.
2. Electricity at the lowest possible price.
3. A constant quality of supply—that is, at constant voltage and frequency—since variations in them affect the performance of the consumer's appliances and equipment.
4. And, of course, no breakdowns or black-outs in the system.

Those demands call for a high level of operational control in the system.

As the size and complexity of power systems have grown, rule-of-thumb procedures have had to give way to more sophisticated methods—high-power mathematics and control theory, digital computers and electronic models.

A team of researchers led by Professor K. Morsztyn, of the Monash Department of Electrical Engineering, is among the many groups round the world working on the problems of control of large power systems.

The Monash team, which includes T. S. Dillon, S. E. Blanch, D. W. Husband, R. A. Gawler and two former participants, Dr. I. A. Wright and Dr. J. I. Brown, has been working on two aspects of control.

- **Off-line control**: The development of a predetermined long-term strategy of planning, design and operation to achieve optimum performance—that is, to meet the consumers' requirements 1 and 2.

- **On-line control**: The control of the existing system from minute to minute so as to achieve best possible performance in response to all sorts of events, both intentional and accidental—that is, to meet the consumers' requirements 3 and 4.

The size and complexity of power systems make any testing of new ideas on the actual system quite impracticable. It...
is equally impracticable to introduce those ideas without proper testing, as any miscalculations could have catastrophic results. So, in studies of strategy, in studies of on-line control, it is important to work not on the system itself but on a model of it.

In off-line control, the Monash team has developed a mathematical model to represent, more successfully than any other, the strategies for the control and operation of systems containing both thermal and hydro power stations. (The presence of hydro power stations introduces an additional order of complexity to an already extremely complicated thermal system.)

The methods developed at Monash, in contrast to previous models, have the important quality that they never produce unrealisable or impracticable solutions.

At an early stage, the Monash team realised that one of the best ways of approaching the problems of on-line control was to develop a model that would accurately represent the power system in all its important features.

An essential feature of a system at work in the community is that the variations in consumer demand are random in nature. Similarly many other quantities in the system are not known precisely at any moment, but are also random in nature.

The team has developed an electronic model of the power system that allows for the representation of those random variations.

This model was originally developed as a Transient Network Analysers for the study of the performance of transmission systems working at very high voltages (half-million volts and above). It created wide interest in Australia and overseas, and was mentioned in the November 1969 issue of Monash.

At that stage it included models of transformers, circuit breakers, transmission lines and lightning arrestors. But, to expand the model of the transmission system into a model of the complete power system (the power system simulator), it was also necessary to devise electronic models of the three-phase turbo-generators, including exciters and turbines.

That was a particularly difficult stage in the development of the full system model: how to represent coupled rotating machines by non-rotating electronic models.

Other teams had developed single-phase representation of turbo-generators; but they did not represent either the three-phase generators or the random variations exerted on them.

The Monash team has now developed the first fully electronic three-phase model of a turbo-generator—a "black-box" in the sense we talked about last issue—so that by varying a few knobs any real machine can be represented.

Experiments on the model will thus represent the behaviour of the system itself, and reveal the necessary control of it in response to a wide variety of contingencies.

The work has yielded a number of papers in both Australian and overseas journals; it is supported by grants from the Electrical Research Board and the Australian Research Grants Committee.

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THE RUSH TO BE RICH

"Mised by the mass of popular Australiana and the many potted histories in the bookshops, the general reader does not realise how little of Australia's history has been thoroughly explored by scholars.

"Of the six colonies or states, only of Western Australia can it be said that a worthwhile, perhaps even a definitive history has been written. In general, the later nineteenth century has received only summary treatment."

Those are the opinions of Dr. Geoffrey Serle, Reader in History at Monash, and an authority on the history of the Colony of Victoria.

Serle's earlier studies yielded 'The Golden Age' (MUP, 1963), a general history of Victoria in the 1850's. Now, with a second major work, 'Rush to be Rich' (MUP, 1971), Serle has continued the story up to 1889.

'Rush to be Rich' examines that generation of young gold-rush migrants who, having swamped the pre-gold-rush settlers, still dominated the Victorian scene 30 to 40 years later.

The first major industrial strike in Victoria was called by the newly-formed Tailoresses' Union against a wage cut in a notoriously low-paid industry. That was in December 1882.

The significance of that event, Serle points out, was not primarily that it was carried out by a women's union, or that other unions were encouraged to adopt direct action, or even that the Trades Hall had moved in for the first time to finance and control a strike. Its real importance lay in the impetus given to the anti-sweating, factory-reform and short-hour movement.

In writing of the churches under stress and of evangelicals in action, Serle raises
issues that were bitterly fought: conflicts of doctrine, secular education and Sabbatarianism, temperance and morals, and the wowser influence.

While one may go to other sources, such as Dunstan’s ‘The Wowsers’, for the more titillating details of the damnation of sin, Serle’s few racy pages on the Salvation Army shed new light on the art of war reporting: objectives, tactics, statistics and all.

The four chapters on the high boom years 1887-1889 set the main theme of fool’s paradise and “Marvellous Melbourne”, without going into the full catalogue of the scandals and rackets of the rush to be rich.

While most of us will find the scandals or follies of our grandfathers and great-grandfathers recited in Cannon’s ‘The And Boomers’, Serle spares time in detail for only three: B. J. Fink, Jimmy Mirams and Tommy Bent. Even their brief but colourful story is tempered by the historian’s objective judgment: “leaving aside the half-dozen leading boomers as special cases, the truth would not be nearly as deplorable as Cannon asserts.”

Evidence and analysis

To examine that generation, Serle went to the original records, much of it in manuscript: official letter books, minute books, telegram books and secret files; the Colonial Office papers in the Public Record Office, London; and the collected papers of participants like Alfred Deakin. (But, he was obliged to say, “only occasional use has been made of material in Chief Secretary’s, Treasurer’s, Lands Department, and other files, which remain almost entirely unexplored territory”).

He read the Age and the Argus for the whole period, and other daily and weekly papers and periodicals; he commended the high standard of journalism in some of the provincial and country newspapers. As well as hundreds of articles, pamphlets and books by contemporary authors, he read some 20 or more unpublished theses for higher degrees—a triumph of sleepless reading.

The reader is guided at every point by some 1200 notes and references to original material, and is offered a selected bibliography of contemporary and other relevant works.

All that is the historian at work. A major point that emerges in Serle’s analysis is the way in which Victoria differed from the other colonies during that period. The broad differences between the colonies in economic, political and social outlook in the nineteenth century have, according to Serle, been largely unrecognised.

In the twentieth century, Australia has become highly homogeneous; we all tend to read back that homogeneity into the earlier and pioneering days. Moreover, the summaries, the general histories of Australia as a group of colonies, naturally tend to obscure the differences. Serle, in his analysis, has brought them into sharper relief.

A RARE BIRD

When Matthew Flinders in 1798 navigated the Furneaux Group of islands off north-east Tasmania, and landed on Preservation Island, he was greeted by a flock of geese. He and his men knocked them over and shot them for the pot.

Flinders described the bird as similar to the Barnacle Goose—a mis-spelling of Barnacle? How it got its present name of Cape Barren Goose is not clearly known; Cape Barren Island (but not Cape Barren) is in the Furneaux Group. The specific name is Cereopsis novaehollandiae.

As early as 1848 Gould expressed the opinion that man’s occupation of its habitat and his hunting of it had “almost extirpated” the species.

At the turn of the century, writers in
'Emu', journal of the Royal Australasian Ornithological Union, drew further attention to the decline—to numbers of only a few hundred.

Since then, numbers of the species, never estimated at more than two or three thousand, rose and fell, depending on the level of human competition: rising when the graziers left the islands in favour of farming on Flinders Island, falling when open seasons were declared on what had become a sporting bird.

Since 1962 the late Professor Jock Marshall of Monash's Zoology department had been interested in these rare birds about which so little was known; studies of their behaviour were begun; four birds were installed on the nature reserve on the campus.

When another open season was declared in 1965, Jock sailed into the ensuing controversy. Since no one really knew enough about the geese—their impact on pastures, their life history, and their ability to withstand the open-season shooting—the controversy generated more heat than enlightenment.

Jock was later prepared to make amendments in typical Marshallian fashion—at the bar of the local island pub—but his long illness defeated him. So the Tasmanians unhappily still look unkindly on Marshall and Monash and their works in the area.

Research grants helped

But Marshall made the point that a game-management program was needed, and funds for research.

The Ian Potter Foundation and the Australian Research Grants Committee responded with grants, enabling Monash to set up a research project, led by Dr. D. F. Dorward of Zoology, and in collaboration with the Victorian Department of Fisheries and Wildlife.

Under this program, emphasis has moved away from Flinders Island and its man-changed habitat to the uninhabited islands off Wilson's Promontory, where a small colony of a hundred or so pairs can be observed in their undisturbed state. (Even so, visiting fishermen have made the birds less tame than Flinders found them 170 years ago).

Richard Marriott, a Ph.D. student who did the detailed work on feeding and digestion, discovered how the birds could live on the salty succulents on those small islands, swept by wind and spray.

Marriott spent three years on this enquiry; every two months he would spend a week or more on the islands, sometimes alone, sometimes with others, ferried out from the mainland by a local farmer turned fisherman.

He noticed that the geese frequently shook their heads as they grazed: Flies? A cold in the nose? A closer study showed that they were indeed running from the nose; but the droplets shaken from the beak were salty.

Two glands, situated just above each eye, somewhat like tear glands, were getting rid of the extra salt that the kidneys could not cope with. Later it was shown that those glands are so efficient that the birds could survive on sea water. All sea birds have the same mechanism; the interest here was to discover it in a terrestrial species.

The geese raise their chicks on those stormy islands in the winter when the vegetation is fresh and green and in plenty. But the geese cannot digest the fibre of dry plants as sheep do, so that in summer some of the birds leave the islands for better and greener pastures.

To trace their movements, the birds must of course be identified. By fitting light plastic collars, or coloured leg bands, or both, to samples of the population on the breeding grounds, Dorward later identified those birds on the feeding ground. (He remarked, incidentally, that they were by no means easy to catch; they would not be lured into traps; even the chicks ran fast.)

Dorward found that the Bass Strait geese move only short distances, to Wilson's Promontory and Gippsland; but those from Spencer's Gulf in South Australia come all the way to the Western District of Victoria.

The point is, they must go to pastures that are not too tall and have a short green 'pick'—to follow sheep would be ideal.

Whereas on their breeding grounds the birds are typically territorial and aggressive, on their feeding grounds they are social and gregarious. Consequently they might gather as one flock of 200 birds on one or two paddocks. At about four geese to one sheep (Marriott's estimate of grazing demand), this could represent severe grazing and a local nuisance.

In total, the effect is obviously trivial, but to the individual owners of those few paddocks, it would be noticeable and perhaps significant.

The conservationists' view, as expressed in 1965, that the birds "did no harm" clearly needs qualifying in the light of our new knowledge. The problem of reconciling rare species and agricultural nuisance is not an easy one.

Dorward thinks that the only satisfactory long-term solution is to provide, on the birds' feeding areas, sanctuaries of adequate size, while giving securing rights to neighbours outside them. With enough sanctuary feeding and absolute protection of the breeding islands, there is no reason why the geese might not again become a sporting bird.

The Australian Conservation Foundation has substantially endorsed these views in its support for the work. The story of the Cape Barren Geese and the research on it is currently being filmed by ABC Television as one of a series on wildlife with Dorward as scientific adviser and commentator.

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Book from Bali

Dr. L. F. Brakel, of Monash's Department of Indonesian and Malay, is seen here reading one of the five manuscripts he recently acquired in Bali.

Though recent copies of earlier works, the manuscripts illustrate a method of writing that goes back to the 5th century—the characters are scratched on the dried leaves of the lontar palm, then rubbed over with carbon black.

The books are now in the Rare Book Collection of the Main Library.

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