GOVERNMENT CONTEMPT FOR SCIENCE

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Abstract

Examines the treatment of science by government through education and the management of scientific research.

Introduction

The general context for the operation of research scientists is given in my book on the Politics of Science. The particular feature that allows the development of contempt is that funds for research typically derive from government wherein governments consider they can manage science as they like. As bureaucrats administer funds to scientists they expect to dictate what scientists do regardless of their knowledge. A good administrator can administer without knowing anything about what they are administering, or so they say. Technical knowledge is considered irrelevant for management simply because they seldom have any.

Politicians are under increasing pressure to do something about the environment. Advice on the environment comes from government scientists, either directly or indirectly through the scientists 'informing' the public. However, this advice often conflicts with the demands of business where the demands reflect environmental constraints impacting on their profits. Nothing must come between business and its profits where that position is justified on the provision of employment.

The irrationality in this justification is that Australia currently has a high intake of skilled migrants to meet the needs of industry. It is cheaper for business to employ skilled personnel from overseas that they can retrench when desired than to train Australians. Industry wants profits and expects governments to aid them in that endeavour regardless of the impact on the environment or community.

The approach of politicians is to disregard scientific advice that does not suite them and to solicit advice that does. The use of dams to win votes has been replaced by the use of environmental legislation ostensively directed at protecting the environment. Its prime use lies in winning votes.

For governments scientists exist to benefit government. Scientists should therefore be controlled and managed so they deliver what the politicians and bureaucrats want. Science has been degraded to the level of rote performance rather than engaging in discovery. As the first rule of politics is, never ask a question unless you know the answer, the chances of their supporting something that addresses the unknown is effectively zero. Bureaucrats get concerned when others know more than they do and the knee jerk reaction is to increase control.

Administrations are organised to eliminate risk as bureaucrats cannot be seen to have failed. As risk is an essential component of scientific research the requirements of administrators and research scientists are in conflict. Bureaucrats can never successfully manage research as their focus on preventing failure ensures that the discovery of anything new can only arise by accident.

Risk is an essential feature of scientific research and this has profound ramifications[1]. One is that scientists must accept that, while failure is undesirable, it is inevitable. Also, failures must be acknowledged in order to make progress. As bureaucrats cannot acknowledge failure any research they control produces more of the same with new work being directed at reinforcing the old. The focus of bureaucrats is to demonstrate that previous decisions were right.

The penchant of bureaucrats for control and its effect in degrading science is seen in the award of the Prime Minister's Science Prize to a high school teacher. The justification was that it encourages more students to study science. Bugger the standard of science, give us someone that delivers what we want, which is more cannon fodder. The more there are the cheaper they come and in that way we deliver against the demands of business.

The education system is based around science, involving 20 years of formal education from primary school to PhD. The question is, what for? While the elite in other areas such as sport are well remunerated scientists generally are not. Indeed, they increasingly accrue large debts for the privilege of being educated to obtain a job needed to repay the educational debts. Educated people start accruing wealth in their late thirties when others are usually well established.

Once highly qualified the opportunities for employment are restricted thereby placing elite scientists at the mercy of employers. For the environment that means government as there is no significant employment for environmental research scientists in industry. In consequence the Government has based CSIRO salaries on those of Government administrators. They were previously based on the lowest grade industry example possible, that of a pass degree engineer, with a small margin for a PhD.

For the educated money resides in the professions as the professions can hold society ransom. Medicine is the best example, but the approach applies with other professions such as engineering and law. Society cannot do without their services. This situation does not arise with research scientists addressing new discoveries as no one misses what they are unaware of. Scientists don't strike as no one would notice the difference.

The following addresses different areas where the actions of government have served to debase science.

Political appointments

Early appointees to the Academy of Science appeared to include many selected for the standard of their work. However, many recent appointments appear to have been made simply to fill the number of seats in the Shine Dome (the Academy of Science theatre). Selections have been based on political reasons such as increasing the representation of females.

With political appointments comes the use of the Academy to promote establishment views, as with dryland salinity and climate change. This degrades science when the Academy is meant to promote the highest standards.

[1] Addressed in The Politics of Science which has yet to be published.

Heads have been appointed to Government research organisations that don't have any experience in implementing scientific research. The most flagrant was Land and Water Australia which existed solely to disperse research funds, and prided itself in using its funds to lever funds from the recipients. The LWA claim was that all projects funded had been successful. This is a bureaucratic assessment in identifying that reports were produced for all projects. The reality is that most research failed to achieve anything useful and some is disgraceful.

While LWA generally identified that research it funded solved dryland salinity their submission to a Senate Enquiry identified that the situation with dryland salinity was more complex than they thought. They had failed. This is not surprising given the deficiencies in their knowledge of how to conduct scientific research. The work funded by LWA usually did not meet the Australian Taxation Office definition of R&D as it seldom if ever contained risk.

Scientific advisors have been appointed and used by Government outside their range of expertise. This applied with dryland salinity where large amounts of public funds have been wasted in addressing symptoms. It is also occurring with water in the Murray Darling Basin where the suggested requirements for environmental flows serve only to take water from irrigators and give it to environmentalists. The likely environmental effect of the proposed change is to increase the rate of degradation of the basin. There is no evidence that the change in water use will maintain the identified 'environmental assets' by way of wetland ecosystems, and the loss of water to irrigation will increase the impact of agriculture on the remainder of the Basin.

Science Prize

A science prize for 2010 was awarded to a high school teacher when the prize is a recent innovation that was meant to recognise excellence in science. It was meant as an incentive for scientists to excel. The awarding of the prize for developing enthusiasm in pupils means that such an incentive no longer exists. It is now equivalent to a Land Care award in recognising effort in implementing the routine.

The approach or rewarding the routine accords with the award of honours to politicians and bureaucrats that simply did what they were paid for. There is no incentive for excellence when progress in science depends on excellence.

Universities

Universities are now expected to train students to do a job rather than think. This change is designed to address the demands of business which involves publicly funded institutions being commandeered by industry. This focus on supplying labour for existing industries has always been explicit for professions but is now expected for all courses including science. It even arises with religion.

This business focus is now expressed by way of the development of courses to meet perceived needs where perceived needs are gauged by the willingness of people to pay to attend. A masters degree in the environment does not require knowledge of the environment as the focus is on procedures. The courses are designed to make individuals aware of the social responses to environmental issues by way of legislation. The degrees should be labeled environmental administration but never are as that degrades their status and hence appeal.

The focus on environmental administration has been at the cost of technical areas that underpin considerations of the environment. Australia was a world leader in water research in the 1960s but now imports many water scientists. While water is again seen as a key environmental issue for Australia the skills needed to address it are not available due to the more than 30 years of neglect. Australia has degraded its skills base.

The degradation in skills has arisen through pressure on universities to churn out degrees rather than sort the wheat from the chaff. The pass levels in first year university courses have increased from around 50 to 90% in 40 years. Explanations include downgrading of courses to allow for the greater proportion of the population attending universities and improved preparation at high schools, but the main reason is pressure from the administration to pass students. Only poor lecturers have high failure rates for students, or so the administrators insist.

This situation has also been promoted by lecturers attempting to increase their salaries. Institutes of Technology became universities so that the lecturers could claim parity with those in universities. Standards of lecturers have declined with the standard of degrees.

The current situation is that, while universities are distributed across the country, they are now graded for quality. This strongly disadvantages good students that for financial reasons are constrained to attending a proximal institution. The nation looses as well as the individual.

The question for employers is how to grade applicants for a position when universities have failed to. My response was to stop supporting honours students as it was a waste of time.

CSIRO

CSIRO has been treated as a cash cow that exists to support industry rather than as a public utility. This started in the mid 1970s as a requirement for CSIRO to obtain 30% of funds externally, a constraint that was removed in the mid 2000s while reducing funding. As administrators bring in nothing this requirement meant that scientists had to obtain 50% of their funding externally.

The covert desire has been to have CSIRO self sustaining and even show a profit. The situation was, however, that the business structure needed to achieve this did not exist. The solution imposed has been to force CSIRO into a business model, now publicly evidenced by the appointment of a merchant banker as Chairman of the CSIRO Board. Bugger the public, the Government bureaucrats want CSIRO to be self funding so that they can appropriate resources currently going to CSIRO to build their departments[2]. Any surplus can go to consolidated revenue and hence be used to further feed their departments.

Given the ongoing cuts in Government funds to CSIRO a recent response has been to scrap science Divisions and replace them with one that addresses social perceptions. The Division of Wildlife Ecology became Sustainable Ecosystems. A Division with a clear focus directed at a public priority in wildlife was changed to address something that does not make sense in science and cannot mean anything to the public. Not surprisingly Sustainable Ecosystems was unsustainable and was merged with the Division of Entomology to form the Division of Ecosystem Services.

[2] CSIRO is a statutory authority as is appropriate for its role. However, this position leaves it vulnerable to attack from Government departments, particularly those controlling finances, but also those setting themselves in competition.

The concept of ecosystem services relates to mankind being at the center of things with all of the earth's resources being present solely for the benefit of humans. Something only has value when exploited to the benefit of man. It involves beliefs that have a basis in the Christian religion and are the core of the existing capitalist system. Ecosystem services is to ecology what intelligent design is to evolution.

The ecosystem services concept addresses the benefit of ecosystems to man. It is completely anthropocentric when science is meant to be completely objective and hence divorced from human perceptions. The approach of addressing ecosystem services is antipathetic to science. It does, however, accord with the capitalist view of how things should run.

The rewards for CSIRO scientists were originally based on merit but that changed to match the situation in the public service of promotion to position. While the merit system was effectively age promotion it did reward exceptional performance.

The current promotional arrangements do to CSIRO what they do in Government departments, reward those that play politics. Use politics to gain promotion, as with claiming non-existent expertise, or by organising to address a newly identified need. Most of all, never be seen to have made a mistake or have failed. The effect in CSIRO has been to have science management dominated by scientists that have low competence at research.

The Government has compounded the situation by directing compulsory changes, as with canceling renewable energy research and stipulating a large program to address clean coal. This change was accompanied by reduced funding and did not involve funding by the coal industry. While Government has a policy that industry should contribute at least 50% to activities receiving Government funds that was waived for clean coal.

The disruption caused by such changes cripples a research organisation as the only benefit organisations such as CSIRO can provide to scientists is continuity of work in their specialist area. While this change only decimated the skills base (1 in 10 gets killed) the cumulative effect of such changes has been to annihilate the skills base (9 in 10) on which a research organisation depends. Such changes have continued because management believes that the skills base can be readily replaced.

Overall the management of CSIRO has treated technical skills needed for effective scientific research as a commodity that can be bought when desired in accordance with a business model. Technical skills are deemed to have low value despite the performance of a research organisation depending on the excellence of its skills base. An extremely high level of technical skill is needed for the effective conduct of scientific research

CSIRO is now managed such that scientists have become dispensable and only the administration need be constant. Indeed, in a declining organisation the number of administrators has grown through reassignment of support for scientists. Scientists are expected to operate without basic support. The inevitable outcome has been a downgrading of science with outputs being directed at the immediate perceptions of politicians and bureaucrats. Bugger the public, administrators are the ones that count and know best.

CSIRO is now identified by its administration, which has never been great, when the benefit to the public has always derived through the technical excellence of its research scientists. Under the current arrangements scientists are hired and fired to suite the administrators and are completely subservient to them. These arrangements prevent CSIRO returning to the glory days when its research provided great benefit to the public.

Appropriation of Research Results

Government departments have a tradition of appropriating results and IP considered useful without payment regardless of the source. A comment I received from a university lecturer after exiting CSIRO was that CSIRO scientists had become the pariahs of science, expecting to take ideas from others while giving nothing. This situation was a direct consequence of the pressure to obtain external income with CSIRO functioning as a business rather than a public utility.

The above situation is critical as science operates though the exchange of ideas. By alienating themselves from the bulk of scientists around the world CSIRO scientists have ensured they will progressively fall behind. Journal publications only contain a fraction of the research undertaken and the delays in publishing can negate their usefulness when conducting research.

A flagrant example by a Government department was appropriation of Healthy Soils Australia (HSA) material by LWA. A politician had arranged for LWA to spend $5M on research to improve soils following representation by HSA. LWA used HSA material to define the project, essentially without change and without any recognition of the source. The injury to the insult was that LWA did not fund any HSA proposal while retaining more than 30% of the funds as management fees.

The implicit mantra of the bulk of CSIRO scientists is that something does not exist until reinvented by them. A tangible manifestation is their suppression of results produced by others done in the expectation that they can claim the success when they develop the capacity to produce them. The ERIC SoilMap was externally denigrated by several CSIRO scientists, and an internal review conducted by the Division of Soils deemed the work to be deficient and unpublishable. Their difficulty is that they have not been able to emulate the results despite the method originating in CSIRO.

The most active suppression involves the use of public money to suppress others. This was done with the review of methods for mapping dryland salinity, which is ironic as the review denigrating the ERIC capability arose through political lobbying by ERIC. While that attempt at suppression was public some suppression is not. The Australian Greenhouse Office (AGO) suppressed the ERIC review of their method for estimating land clearing. While the AGO funded the ERIC report the public will never see it as the conclusions did not suite the AGO. My initial attempts to remedy this situation invoked their slandering me hence the need to address the issue using results completely divorced from the study funded by the AGO.

Given due legal process the ERIC report on the method produced for the AGO should shortly become public.

Personal Record

Most of my good work in CSIRO was done without the activity being approved by management[3]. The paper on vegetation development represented a theme flowing from my PhD that could never receive CSIRO support through being too theoretical. My coming out with the use of radiometrics for soil mapping was met by the Chief asking why was I working on soils. I was located in the Division of Water Resources and the Division of Soils was 150m away across the road. The one activity I did against the direction of a Chief, that of using

[3] The Defence project work evolved to be task based wherein I recommended activities to Defence with approval by Defence. Additional research activities were funded by profits. Defence consultancies were specified by Defence with CSIRO insisting that I do them without additional labour resources.

satellite imagery to map vegetation, resulted in the development of an end member analysis that does not depend on prior knowledge of the end members. The analysis was essential in the development of the soil mapping method.

The conduct of work in CSIRO was suppressed by others claiming territory. Receipt of benefit from work was suppressed by others suppressing publication through internal review. It was also suppressed by management being unable to make decisions on expenditures required for publication. The early image processing results for the Shoalwater Bay Training Area contained around 8 large maps. The report was never published because of the cost of reproducing the maps at a useful scale. The report would still be useful due to the topics addressed and the detail provided in the maps. The maps address military as well as environmental issues and bits have been used in several reports.

The CSIRO activities resulted in 23 journal publications in 26 years while post CSIRO equivalent journal publications number 81 in 14 years. While some of the 81 were developed in CSIRO they either do not derive from approved work or the work was rejected for publication. Few of the 81 papers would be accepted for journal publication because of their content and the form of presentation.

The quality of the work is considerably higher post CSIRO. This partly reflects experience but mainly arises because of the removal of administrative constraints. In ERIC there was no constraint on the scope of what I could address. However, financial constraints meant that the research invariably had a commercial application in addressing a land use need. The theoretical considerations have arisen from task based research rather than program or disciplinary based research.

Conclusions

Governments seek to increase the number of students undertaking science as a nation progresses through its science. The current incentives are identified as being designed to make science attractive by being interesting. Attract students by making science glamorous.

While wanting the best students to undertake science Government actions militate against this. Intelligent individuals look at the rewards versus cost an effort. Pure science is a hard degree, and progressing through a PhD can incur a considerable cost that must be repaid. Apart from the debt, the lack of money while at university stifles social life at a time when it should be most active. As for the rewards for being the best, expect parity with a high school teacher and much less than a high school principal.

The situation is worse than hypocritical as Government is supporting industry in its efforts to make huge profits by implementing a system that keeps scientists subservient. Theoretically at least industry works on a system whereby effort is rewarded by money, but that is not applied to scientists. Indeed, the Government is pressured by industry to increase immigration to reduce the cost of skilled labour. Why do science when economics and other professions are much more financially rewarding and, by the standards of a good research scientist, much simpler and low risk.