

Colonial Science and the Creation of a Postcolonial Scientific Tradition in Indonesia

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“A scientific society flourished at Batavia [Jakarta],” Lewis Pyenson points out (p. 18)

when Toronto was a collection of homesteads and cabins. Scientific doctorates were earned on Java before they made an appearance in Australia. The East Indies preceded Japan, Argentina, Canada, Tunisia, and India in providing a research laboratory to a future Nobel laureate. Physicists at Bandung succeeded in carrying out delicate measurements that for years confounded competitors at Pasadena and Chicago ...

With these arresting observations Pyenson introduces and claims our attention for his subtle, intensively researched study of what might at first seem an arcane subject: the growth of the natural sciences – especially astronomy, geophysics, and physics – in the Dutch overseas empire.

Densely argued, this study is always absorbing. For it does not simply tell a tale, however interesting, but seeks to analyse developments and to make its analysis address important and far-reaching issues: about the social context of scientists, of scientific endeavours and traditions generally; and, specifically, about the nature and dynamics of European cultural and political hegemony in the nineteenth and early twentieth centuries and the involvement of modern scientific research and learning in that worldwide process. In short, Pyenson’s closely focused case study is concerned to examine – patiently, dispassionately, and in minutely detailed circumstantiality – the contentious question of “cultural imperialism”. (It was, for this commentator, a particular pleasure to read this study in Kuala Lumpur where, in a public lecture four years earlier, a Pakistani Nobel laureate in physics – evidently a true believer in the faith that Science writes the script for the story of its own development unconstrained by external forces – had impatiently denied that there was any such thing, and had ridiculed local scientists who sought to raise with him the question of the social context of science and its effects upon scientific practice, especially in so-called Third World countries).

The role of external forces, interests, and circumstances is evident – as in other colonial situations – in much of the Dutch scholarly endeavour in

what was to become Indonesia, especially in archaeology, history, philology, ethnology, comparative law, and Oriental or Islamic studies. In seeking to document the international political dimensions of Dutch scholarship – the interaction of the socioeconomic and political forces of imperialism with the cultural organization of scientific discourse and activity – Pyenson quite strategically, and tellingly, focuses his attention elsewhere: on the exact sciences where distinguishing clearly, and also tracing the intricate interconnections, between political-economic and intellectual-scholarly or broadly cultural motivations ought, at least in principle, to be less problematic. This examination of Dutch science in its overseas colonial setting unravels, in each of the three disciplinary areas investigated, the sinuous intersecting of different interests – government, academic, and commercial – in their distinct and often competing metropolitan and colonial forms. These interrelations, as Pyenson traces them, are intricate and interesting precisely because they are shifting, contingent, and socially constructed – not, as any simple notion of “cultural imperialism” might suggest, somehow predetermined and unequivocal; and because, further, they are constructed from odd fragments and conjunctions of circumstance, interest, accident, ambition, and opportunity, even opportunism, rather than any merely unidimensional intersection solely of immediate interests, no matter how insistent. Not a conspiracy, then, nor even an impersonal, structurally induced convergence of diverse influences all working broadly in the same direction, cultural imperialism for Pyenson is rather the outcome of the untidy, even inchoate, clash of a variety of forces of variable strengths pulling unevenly in different directions and varying over time in salience and also in their clarity of articulation. His position is a subtle one, and its exposition demands the reader’s sustained concentration.

Pyenson’s argument is grounded in three distinct but interconnected, even sequentially and cumulatively interrelated, disciplinary case studies. Beginning with the long frustrated scientific aspirations of J.C. Oudemans – resentfully forced to sacrifice his broad intellectual interests in astronomy to practical demands, of commercial and military origins, for accurate topographical surveys and maps of Java – the first study analyses the sources of the remarkable Dutch dominance of astronomy, or at least their hugely disproportionate preeminence in that field, over much of the twentieth century: in the work of the footloose maverick J.G.E.G. Voûte; his patron K.A.R. Bosscha, a wealthy planter, dilettante scientist, and presiding authority over a variety of scientific and scholarly committees in the Indies whose money and politically well-targeted enthusiasm led, among many accomplishments, to the establishment of the Bosscha Observatory at Lembang, near Bandung; and W.H. van den Bos, a major figure in southern hemisphere astronomy but one accorded rather less than

his due by a number of ungracious United States scholars, his competitors in the centrally important area of research on double stars.

The second area concerns geophysical research, inspired by an originally Humboldtian vision, into the earth, its weather, tides, and oceans. Again, like Oudemans in astronomy, the nineteenth century pioneer in this field, P.A. Bergsma, suffered obstruction (or at least less than full official cooperation) and frustration, being long denied the facilities of which he had initially been assured to pursue his scientific interests in geomagnetics and pressured instead to provide useful meteorological services suited to the practical needs of colonial administrators and commercial plantation agriculture. Yet, impeded though they may have been, these early endeavours too, like those in astronomy, were not barren. Succeeding where Bergsma had failed (after much initial wariness the two eventually reached a *modus vivendi*) E. van Rijckevorsel, a wealthy and politically well-connected independent scientist was able – with the intervention of C.H. Buys Ballott, one of the barons of Dutch metropolitan science – to bring about the creation of the Royal Magnetical and Meteorological Observatory at Batavia, which, despite its own broad research ambitions and the pretensions encouraged by its official status, was able in time to establish a workable division of scientific territory with Bosscha's private observatory. The scientific lineage associated with the Royal Observatory would include J.P. van der Stock, who worked on terrestrial magnetism and atmospheric electricity; W. van Bemmelen, its long-serving early twentieth century Director who also pursued research in pure and applied geophysics and upper atmosphere physics; and at least three further figures, two of them van Bemmelen's successors in office, who were prominent in the heated debates of the 1920s and 1930s over ultraviolet radiation in tropical sunlight: H.P. Berlage, Jr (a wide-ranging geophysicist also active in seismology, meteorology, and planetary cosmogeny), J. Boerema, and C. Braak. Also noteworthy in this tradition is F.A. Vening Meinesz, a wealthy, politically well-connected independent scientist possessing a flair for showmanship that endeared him to an equally publicity-conscious Dutch navy. Avoiding, through that special access, the disturbing effects of surface waves by housing his gravimetric pendulum on submarines, he was able to bring geodesy and geophysics to bear upon a variety of problems in dynamic geology – ultimately, though perhaps in a losing cause, in arguments leading to the inception of continental drift theory.

The work of these scholars, like that of Oudemans's successors in astronomy, eventually transcended the constraining pragmatism and parsimoniousness of official policy: just as the Bosscha Observatory came to assert an independent Dutch scholarly presence, an academic identity and direction of its own, “precisely because Voûte refused to become an

errand-boy for metropolitan academics and colonial agriculturalists" (Pyenson 1989: 82), Dutch geophysics centering upon the Royal Batavia Observatory likewise "worked in colonial settings with a rare intensity that stemmed from an imperative to understand the world in general terms" (Pyenson 1989: 124). Refusing to remain simply local in its preoccupations, Dutch science in its colonial outposts became appropriately global, guided increasingly by abstract theory rather than the overwhelmingly pragmatic and mercenary concern for useful applications that were dear to planters and colonial functionaries of little imagination.

Connected to this second scholarly lineage, even emerging to some degree from it, are the principals of Pyenson's third case: two scholars, or rather two remarkable if cruelly unequal scholarly husband-wife partnerships, in Dutch colonial physics. Assisted by his wife Tettje Clay-Jolles, Jacob Clay investigated the atmosphere's even now most eagerly discussed ozone layer, provided decisive evidence that cosmic rays consist of charged particles rather than photons, and – in opposition to the work of Boerema and his followers Vrij and Zeeman – established the effect of variations in latitude on the intensity of cosmic ray penetration. At the very forefront internationally of its field, Clay's work received only belated and incomplete recognition: mainly because it was ignored or dismissed, and Clay's career and prospects of Nobel recognition blighted, by the shamefully self-interested and scientifically reprehensible manoeuvres of the influential United States Nobel laureate – the "Pasadena Babbitt", as Pyenson (1989: 152) characterizes him – R.A. Millikan, whose support for the photon theory of cosmic rays in stellar novae or supernovae would in time be totally refuted. (Hardly less regrettable than Millikan's own machinations is the tardiness of many of his U.S. colleagues who become convinced of the error and impropriety of his campaigns in defence of his view of his own preeminent place in the history of science to say so.) Appointed from Java to a chair in Amsterdam in 1929, Clay maintained his own position throughout the 1930s with a grace and dignity that were unfortunately no match for Millikan's campaign of deprecatory interventions.

The second conjugal scientific partnership was that of B.J. van der Plaats and Agathe van der Plaats-Keyser who – crossing formal disciplinary boundaries in a manner Pyenson shows was typical of the Dutch but not other national scientific traditions – linked medicine and physics, thereby pioneering radiology not only in Java but throughout Southeast Asia and the world's tropical areas generally. This achievement required not only the devising of equipment sufficiently resistant to the deterioration and distortion caused by tropical humidity, insects, and unreliable electricity supplies of variable voltage but also proper calibration and standardization of equipment taking account of

idiosyncratic local levels of background radiation. As a pioneer in this area van der Plaats built not only upon the work of earlier Dutch colonial radiologists such as M.H. Knoch, Sr but also the broader tradition of Java-based medical enquiry in which C. Eijkman had done the research on beriberi that ultimately won him a Nobel prize.

The enduring monument to Clay's work especially, and also van der Plaats's, Pyenson demonstrates, was not a Nobel citation but the creation and effective institutionalization – in the illustrious Bandung Institute of Technology – of a distinct local research tradition and scholarly culture, Dutch in its origins but Indonesian in its prospective career. Created alongside the longer established STOVIA (or native Javanese doctors school) whose origins go back to 1851 and whose diplomas were by 1927 accorded equal standing in Holland itself with all metropolitan certificates, the Bandung Institute was founded in 1920 under a private committee headed by the irrepressible K.A.R. Bosscha (thereafter chair of its governing council) and became a government charge in 1924, when a now prestigious law faculty was also set up.

Seeking as the Institute's founding professor not a crude technologist but a physicist who would embody and propagate the rich values of Dutch learning, Bosscha's committee felicitously recruited Clay, who from physics had detoured into the neoHegelian philosophy of science and thence, via the neopositivist critique of Dutch Hegelianism, back into physics – or, rather, forward into twentieth century Einsteinian physics. On his arrival in Bandung and ever thereafter Clay continually restated the battle-cry, also his own, of nineteenth century German humanism. No-one in the modern world, even in the colonies, he insisted, could be considered truly educated who had not engaged with the great minds of ancient Greece and the entire tradition they had founded. It was not sufficient for the Dutch to bring technology alone to the Indies, and it would be wrong for Indonesians to think that technological advance alone was the basis of modern European civilization and its successes. The recent explosion of technological innovation might make things appear this way, but alongside and above technological growth stood the humanities as a source of human intellectual and cultural, even spiritual, enlargement. It was imperative that these broader than merely technicist concerns be brought to the fore and advanced, in the Indies as elsewhere, as the context and foundation of technical education and expertise itself. "Here," observes Pyenson (1989: 142), "was a twentieth-century man who knew how to sing the nineteenth century neohumanist score. Here was a scientist at an institute of technology who valued the classics as an essential, civilizing force." In his laboratory he urged not simply the practice of science but a view of science as a foundation of civilization. Not vulgar mechanical apprentices in

practicalities, the Institute's students must be engaged in the quest for vital knowledge itself.

Whatever careerist or other self-serving concerns may have lain behind Clay's articulation of this noble vision, whatever the unarguably numerous seamy and corrupt features of Dutch colonialism in Java that Clay's endeavours accompanied and may even have been employed, by some at least, to obscure or condone, and whatever the subsequent hardships and interruptions that Indonesian science and critical enquiry had unhappily to undergo during war, revolution, and since, what the Bandung Institute stood for and encouraged young Indonesians as well as Dutch expatriates to aspire to was a notable and undeniable legacy – a rich intellectual, scientific, and cultural endowment that has helped shape modern Indonesian culture and render it distinctive in Southeast Asia.

This remarkable legacy – no less real for being largely unintended by so many of Clay's compatriots, both in Holland and the Indies, who might neither have understood nor endorsed his passionate high-mindedness – rested upon a simple fact. Dutch colonial science was part of Dutch science, and Dutch science in turn was an integral, even eminent, part of world science. Accounting for this fundamental fact requires attention to the organization of scientific endeavour at both the colonial and metropolitan levels.

In the Indies the significant battles were fought in the nineteenth century, when local learned societies and scholarly associations were established. These victories, subsequently consolidated by tenacious twentieth century colonial scientists such as Voûte, ensured that scientific activity in the Indies was neither totally subjected to the domination of metropolitan academic priorities or personalities – especially the Leiden hegemony – nor at the same time forced to maintain a marginal, impoverished independence, surviving precariously outside and cut off from the larger world, concerns, and animating values of Dutch scientific and scholarly culture. The autonomy that Dutch colonial scientists enjoyed from, but also within and as part of, the proud world of Dutch learning is well indicated, and was given actual effect, in what was perhaps their central scientific practice: of publishing their own research papers and reports in their own high quality scholarly journals and monograph series which ensured them unimpeded and prompt publication – as members of an identifiable, functioning scholarly community, not as outside supplicants dependent upon the favour of others to communicate with a larger world of scientific peers – while at the same time having their research results that were presented in detail in their own outlets also reported in summary form in the scholarly journals, and sometimes also at meetings, of the metropolitan scientific associations and learned societies. This special relationship of encompassed autonomy – of full intellectual

“citizenship” in the world of Dutch science without being subject, as some subsidiary department or section, to its direct dictation – ensured that, far from trivial or parochial, the agenda of Dutch colonial scientific endeavour explored by Pyenson was an impressive one, international in its horizons and in the recognition its distinction earned.

If Dutch colonial scientists were able to participate in world science through their involvement and “intellectual citizenship” in their metropolitan scientific community, what were the sources of the unusual strengths and international eminence of Dutch science itself? At various points throughout his analysis Pyenson touches upon a number of these: factors affecting both its intellectual character or animating values and also the institutional forms and structures in which it was organized (and in which, accordingly, Dutch scientists pursued their interests, ambitions, and careers). Quite unusually, late nineteenth and early twentieth century Dutch science – as the careers of Clay, moving full circle from physics to philosophy and back, and van der Plaats, trafficking between medicine and physics, among many others indicate – was remarkably open and interdisciplinary, and thus unusually free from the “disciplinary sclerosis” (Pyenson 1989: 3) that resulted from the creation, behind segregating intellectual barriers, of small academic baronies excessively responsive in their governance to, and unduly protective towards, the maintenance of scholarly territory rather than scholarly vitality. This ecumenism was especially characteristic of the natural sciences, enabling the Dutch to win Nobel prizes, for example, in fields such as physical chemistry that lacked disciplinary identity and organization. At the same time, the Dutch scientific community was no dreamy world of apolitical disinterestedness; on the contrary, it fairly teemed with ambitious academic barons and other brokers of interests with government, both metropolitan and in the Indies, and with mediators of relations with the world of private philanthropy – as, for example, the cases of C.H. Buys Ballott and also the noted astronomer, socialist theorist and educator, and politician Antonie Pannekoek (who reappears several times in Pyenson’s analytical narrative) testify.

This enthusiastic commitment, through its own aspiring statesmen and lobbyists, to the public world of government and practical affairs is related to a further characteristic feature of Dutch science: its ability to keep theory and practical applications in continuing relationship. Theoretical activity, innovation, and productivity were advanced precisely by refusing to build up in various areas, as the Germans for instance did, large and inward-looking or self-absorbed coteries of pure scientists. In contrast to the Germans with their “legions of pure mathematicians,” for example, “the Dutch valued mathematics primarily as a tool for understanding the physical world. Dutch physicists and chemists knew how to find the mathematical overtones of nature’s laws, and they freely followed the lead

of any promising mathematical expression” (Pyenson 1989: 3). In this regard Clay was again a typical or emblematic figure, his concern that the pursuit of practical science occur in a context of widely informed critical enquiry finding its counterpart in the conviction that the advance of pure theory, learning, and scientific discovery must grow from, and be nourished by, the cultivated self-understanding of scientists concerning their own professional role and activities: their recognition that how, as scientists, they “had their very being” in the world, and that the sources of the intellectual challenges confronting them, were matters more broadly based than in science, narrowly conceived, itself.

This fundamental orientation in turn seems intimately connected to broader patterns of development of Dutch society and culture in the late nineteenth and early twentieth centuries, to features of that particular phase or “conjuncture” of its growth: specifically, to the recent and rapid enlargement of its modern industrial sector, the openness its political evolution displayed during the zenith of classical European liberalism, and the expansion and modernization in that context of Dutch education, as well as its own increasing openness to genuine talent and promise. Together, these related transformations enabled Holland as a whole to move with singular ease into the modern technological and, if not egalitarian, then competitive-meritocratic era.

In this connection Pyenson points out (1989: 4) that Dutch science of this period, like its German but unlike its French and English counterparts, insisted upon a demonstrated facility in research as a basic requisite for scientific certification. At the same time, Dutch national educational authorities, like the French but unlike the German and English, held engineering and the technical applications that grow out of pure science in high regard: here again Clay’s insistence at Bandung that the engineers produced by his Institute be not mere practitioners of techniques acquired but form their professional skills upon their basic education in mathematics and physics is indicative in its concern for – its commitment to the interdependence of – theory and practice. Moreover, Dutch scientists, unlike the French and German but here resembling the independent scientific “gentlemen” of England, found themselves in an unusually open and competitive intellectual community that encouraged ambition and talent, thrived on controversy, and impelled them onto a path of active involvement in society and public affairs at large. Yet, while in no way cossetted or self-protective position-holders, they operated, unlike their English but like their German counterparts, from major state-supported academic and research institutions – that in the Netherlands, with its own patrician traditions going back to the heyday of Dutch mercantile colonialism, were heavily supported by both private philanthropy and municipal initiative and funding. Together, this entire constellation of

internal features of Dutch society and its scientific community lay behind Holland's period of "astonishing innovation" (Pyenson 1989: 3), giving a singular impetus to the development of Dutch science in its international context.

To Pyenson's account of this constellation may be added the fact that Dutch science, like the Dutch bourgeoisie generally, was remarkably cosmopolitan, in fact truly and incomparably European. Well into the industrial era, and long after Holland's mercantile era economic preeminence had begun its decline, the Dutch, like their language, were no longer of major international significance in their own right, on their own now rather confined cultural and territorial grounds. Forced therefore to become fully conversant with – and strategically placed to serve as cultural brokers between – German, French, and English culture, they became the first genuine Europeans, whose Europeanness in fact largely helped define, rather than being merely a secondary manifestation of, their particular modern national identity. Like their "outward looking, assimilationist, and tolerant" culture generally, receptive Dutch scientists stood "at the intellectual crossroads of Europe" (p. 84), but in their own professional and institutional context. Resting on an emphasis upon excellence in research, loyal service within government-supported scientific institutions, both at home and in the colonies, and the enlistment of pure science for a combination of commercial, political, and (civilizing to some degree the colonial masters as well as these whom they dominated!) also broadly cultural as well as purely scientific objectives (Pyenson 1989: 183), Dutch science held out the prospect of reward and advancement to its most successful exponents: not only researchers in Holland itself but also those, like Clay, in the colonies who – having proved themselves capable of seizing their overseas opportunities – won the ultimate recognition of a call to a European chair. This, however, was possible because in Dutch science, unlike some of its rivals, prominence followed only upon "internationally recognized accomplishment" (Pyenson 1989: 84).

Apart from its intrinsic interest, Pyenson's argument makes further claims on our attention. At this point it addresses the contested relation of science and "cultural imperialism", seeking to redress the in some ways Anglocentric focus of much of that debate. But the case of England, simply because it was the dominant international power politically and economically at the height of European colonialism's world-restructuring career, is for that very reason atypical and hence misleading, one likely to display an all too immediate, unequivocal, and directing relationship of politico-economic interests upon scientific activity. Akin more in the nineteenth century to a Portugal that had retained its cultural dynamism and consolidated its scientific base than to England with its confident and largely material as well as moral dominance, the case of Holland in

Pyenson's reading makes a different point. It not only indicates how seemingly "impractical scientific resources furnished political leverage in contested or uncommitted parts of the world" and how the institutions of pure science "served to entrench a metropolitan power" in its peripheral territories (1989: xiv). In a period when the Dutch were no longer a major commercial or political power internationally, the echoing of "the harmonies of pure learning" against "the texture of imperialist incursion" (1989: 18) is to be comprehended differently: by recourse to some of the more influential social theories of the 1980s – Michel Foucault's ideas on the shaping of power by, and its immanence in, scientific and disciplinary discourses; and Clifford Geertz's arguments that, far from emerging from any pre-existing "givens" of power, simply to rationalize and ratify its purposes, culture enters into the very shaping, and is thus constitutive, of power itself. (Since power has first to be imagined before it can at all be used, or responded to, what is primary for Geertz is not its "mechanics" but its "symbolics".)

Rather than serving, then, as the mere handmaiden of given and insistent colonial interests (commercial, political, or strategic), Dutch science played a different, much larger but far less easily encompassed role in Holland's imperial career. In Pyenson's reading, nineteenth century Dutch colonialism itself was shaped and sustained at its very core not materially, as was its dominant English contemporary, but culturally – in large part by Dutch science and learning. Science was not a simple projection of colonial power; rather, colonial power was established and projected through, one might even say in the form of, Dutch science, learning, and scholarship. The sources of its transient political ascendancy, and hence also the nature of its enduring impact and legacy in Indonesia, were essentially cultural: vindication once again, this, for Clay's view of the civilizational rather than simply material or technological character and significance of the Dutch colonial presence. A minor power that had to rely on the goodwill of the major imperial players even to stay in their imperial business, Holland based its overseas position and strength instead upon its cultural authority, and thus upon the special constellation of circumstances that impelled it into international scientific eminence. That "ensemble permitted a tiny nation on the North Sea to rule an overseas empire larger and more culturally diverse than Europe" (1989: 183).

The implications of Pyenson's argument, taken further than he himself pushes them, throw important comparative light upon the broad cultural impact of European colonialism in the larger "Malay world" or Nusantara, as it is known generally throughout Indonesia and Malaysia. In Indonesia the Dutch, no longer a major political or economic power towards the end of their long colonial career, sustained their ascendancy through the genuine respect which they compelled for their cultural

authority, and thus passed on to a generation or two of young Indonesian *evolues* – a nascent, far from parochial intelligentsia shaped within the elite institutions of their colonial educational system and culture – something of their own cosmopolitanism. The enduring character of this legacy is typified, for this commentator, by a meeting several years ago at an international seminar on Islamic studies in Jakarta where a professor from Yogyakarta and former Indonesian Minister for Religious Affairs – a physically sprightly and mentally agile septuagenarian still conspicuously formed, and also continually stimulated, in his thinking by what he had received from his Dutch colonial education in philosophy, sociology, and comparative religion in the 1930s – fell eagerly upon the visiting foreign sociologists participating in the seminar in his enthusiasm to discuss, in his most informed, scholarly, and critical fashion, the works of Max Muller, Joachim Wach, Ernest Troeltsch, and Max Weber. What was so striking and memorable about this encounter was not only the vitality of Professor Mukti Ali's intellectual interests but also – following the discontinuities in Indonesian cultural development since the colonial period and various periods of relative intellectual isolation from more recent trends and sources of contemporary culture – their somehow strangely archaic character, like that of some beautifully preserved fossil from a pristine age suddenly made accessible by a form of time-warp or intercultural time-travel. Similarly, no-one who reads the collected speeches and journalism* of the now almost forgotten and scarcely understood Sukarno – one of Clay's early batch of Bandung engineering graduates – can fail to be struck by this same, if perhaps pedantic and oddly dated, intellectual breadth and cosmopolitanism. With his ample and easy, if not always accurate, allusions to educated, progressive European culture (including his occasional malapropisms, such as his dubbing of his "Year of Living Dangerously" with the quite Esperanto-sounding coinage of *vivere pericoloso*) and his no less persistent references to developments in modern science and technology as the core of modern culture and civilization generally in which the Indonesian nation, shaped by its own sustaining national culture and movement, would in time willy-nilly have its rightful place, Sukarno appears not only as some Javanese fusion of H.G. Wells, Lancelot Hogben, and Hyman Levy but as an authentic representative product of the Bandung Institute. For all his many imperfections and limitations, it is this Bandung character which makes him with his hybrid visions an embodiment of what the emerging Indonesian nation then aspired to be: in its own terms a genuinely modern society and culture, fully and rightfully part of the modern civilization of all humankind.

In contrast to the Dutch colonial career, the British penetrated late into peninsular Malaya, only at the end of the nineteenth century, at the very height of their international economic power and at the arrogant zenith of

**Di Bawah Bendera Revolusi*, 2 vols. Jakarta 1964.

their imperial prominence. Taking their ascendancy for granted as their historical right, they felt no need to probe, explore, question, or analyse its cultural character and sources – or to acknowledge its transient, contingent nature, since they assumed it would be enduring. They established their own ascendancy over Malay, and later Malayan, society on this crass foundation of brute political and economic dominance, creating in their new colonies no intellectual traditions or cultural institutions worthy of more than passing mention. Indeed, those who headed and embodied the British colonial presence in Malaya were not only the representatives of a power unreflectively self-satisfied at the summit of its brief dominance. They also tended, in general, to come from the least intellectually accomplished and culturally aware corners of British society – from the younger sons, with their uncertain material futures, of the materially grasping but now declining rural gentry: the reactionary, philistine “county” element whose own ways and ideas displayed about the same relation to civilized European culture that so-called English cooking bore to modern European cuisine. Proud of their uncompromising John Bull Englishry, they were not only vulgarians in an era of European cultural efflorescence but also linguistically and culturally monoglot at a time when the Dutch moved easily and mediated richly between German, French, and English as well as their own language, literature, and culture.

Unable, because of this limitation, to create, transplant, or bequeath in Malaya anything of any enduring intellectual or cultural value, they could leave behind nothing other than a poor version – since it was transmitted by a colonial education system of pathetic inadequacy – of their own paltry intellectual culture. With no larger moral or intellectual vision than that, what little they did leave in Malaya was no wider or larger than their own culturally narrow selves: an even more rudimentary and mindless version of their own impoverished positivism, their blinkered empiricism, their morally crippled utilitarianism, itself a mere calculus of tawdry interests that served them as (or instead of) an authentic social philosophy.

This nineteenth century British philistinism lives on, somewhat redesigned and modified perhaps, in so much of the dominant Malaysian ethos in educational philosophy (including the current vogue for so-called vocationalism and the promotion of culturally ungrounded training in mere – and soon to be obsolete – skills, rather than the encouragement of the only kind of education that can be of any practical, as well as human, value in an era of rapid and ever accelerating social, cultural, and also technical change: the development of the ability to think, analyse, and adapt; to respond, act, and plan rationally as well as communicate effectively, both within that process itself and also in more reflective discussion of its character and cultural presuppositions). This same approach or orientation, the lasting British cultural legacy, is not only

dominant in the area of national educational philosophy but also in intellectual including academic culture generally. It underlies virtually all official thinking about economic development and nation building. But it is a culture not even of “muddling through”, merely of muddling along and meddling about: of seeking prosaically inadequate ad hoc administrative or managerial “solutions” to complex human situations; of impatiently setting aside as “impractical” the need to define and contextualize problems and issues before tackling them, the simple failure first to “stop and think”; of instead seeking and concentrating upon uncritically implementing purported technical or managerial solutions (the often borrowed, second-hand, inferior, or even quite inappropriate “quick fix”), even to the most intractable human problems and complex cultural issues; fundamentally, of assuming that every challenging human issue is merely a “problem” with some “solution”, if only the duly designated responsible authority, aided by a range of however credentialed technical advisers, can identify it! (Of course, with the strange belated return of that utilitarianism in the 1980s, namely the quite overwhelming intellectual and political ascendancy of neo-classical economics embodied in various New Right policies and Thatcher/Reaganite forms, the conquering dominance of this approach has become worldwide. The point is that, while elsewhere it has so often had to batter its way to dominance by demolishing a variety of other cultural orientations that had previously held away, in Malaysia there was hardly any impediment to its advance, any basis of cultural resistance that it had to encounter.) This English utilitarian cultural legacy – now diffused throughout the Malaysian educational, academic, administrative, and managerial ethos – is indeed a heavy burden, all the more so because, to so many who are weighed down by it, it is unrecognized, invisible, and therefore experienced as somehow “natural”, part of the taken-for-granted and given world like the unacknowledged weight of atmospheric pressure itself.

As if these narrowing effects in the realm “practical affairs” and policy debates were not enough, the adverse residual consequences of British colonialism’s ad hoc utilitarian cultural legacy extend further. The unnecessary separation that it created, the false dichotomy, between practical instrumental action and moral concern or inquiry not only means that practical problems are approached in a purely technicist way, in a cultural and moral vacuum, and therefore in a way that (even in technical terms) is hardly adequate. The same false, unnecessary separation has also, through its moral abdication, been culturally stultifying. It has created the circumstances in which the high intellectual and moral grounds of opposition to the approach of the technicist administrators and managers and their expert advisers has been yielded to another approach, its virtual inverse image, which is no less narrow and one-sided. A near monopoly of

discussion of the ethical, moral, human, spiritual, and cultural dimensions of social life and economic development has been passed, by default, to a single group: the Islamic intellectuals, or rather the powerful neo-traditionalist pacemakers among them. It is of course not wrong for this, or any, group to engage, or even be unusually prominent, in discussions of these matters: this is to be applauded and encouraged. The fault is not theirs that they do so, if it is a fault at all, but that of others: of all those who really belong in, and should see themselves as answerable in more than technical terms within, that culturally critical debate but have simply opted out, prevented by their distorting education within the old utilitarian assumptions either from recognizing that they belong in it or else from effectively joining it.

This abdication of theirs has made possible the circumstances in which, to the general detriment, so much of this essential debate – one which turns largely on questions of moral philosophy, on the cultures of rationalism and science, and on the nature and continuing relevance, or otherwise, in Malaysia of the Western intellectual tradition – is largely taken up, and for all participants in it decisively shaped, by neo-traditionalist ideologues who remain as unfamiliar with the intellectual traditions they reject as they are critical of them: who have no adequate grasp of the Western intellectual and cultural history that they dismiss or of its legacy of centuries of philosophical debate (moral, aesthetic, legal, social, and political) that are by now – Plato and Aristotle no less or more than Ibnu Sina [Avicenna] and Kung Fu-Tze [Confucius] – part of the universal heritage of humankind. Instead, these neo-traditionalist critics are content to invoke, and to arrogate to themselves and their own polemical position, a heritage of Islamic scientific rationalism that they themselves unfortunately do not intellectually command or embody; and, further bolstering their position, to claim for themselves as Muslims the credit which is of course due to Islamic culture for keeping alive, from antiquity until the European renaissance and modern age, the Greek philosophical tradition of Plato and Aristotle, but without themselves confronting – indeed, as grounds for summarily dispensing with the need to immerse themselves in, engage with, and personally master in intellectual terms – what Plato, Aristotle, and a host of other European rationalist thinkers and contributors to the universal culture of humankind have had to say. Such a position dishonours, and makes shamefully inadequate use of, both the Western and the Islamic rationalist traditions with their intertwining histories. On its basis no adequate debate of these central end-of-twentieth-century issues, in Malaysia or anywhere in the modern world, can be conducted. But these issues simply cannot be discussed by those whose education – by unfortunate omission or now (more commonly) ideologically-advised design upon utilitarian pre-suppositions, or else from an insecurely

grounded intellectual critique and outright rejection of the modern rational tradition – has left them ignorant of what such discussion might entail.

In its far-reaching implications, finally, Pyenson's study is relevant not simply to some perhaps obscure historical arguments over the relation of science and colonialism, nor is it of significance only to debates about the origins and tenour of contemporary Indonesian and Malaysian culture. In its analysis, moreover, of how the foundations of scientific discourse have been, and by extension might be, established, this study of Dutch colonial science in Southeast Asia is highly germane to a variety of significant discussions now going on – in both the natural and the social or humane sciences, in both Indonesia and Malaysia, and including a number of joint Indonesian-Malaysian dialogues seeking to broach the gap between their different national disciplinary traditions – about what might be involved in creating national and even Nusantara regional scientific and scholarly traditions appropriate to prevailing circumstances: ways of participating in and contributing to science and learning as an international and universal human venture, not on borrowed or entirely derivatively European (or Euroamerican, or Russian, or Indian, or Chinese, or Arabic) terms but within idioms of discourse only now beginning to be fashioned that would be as authentically Nusantaran as they would also be, on equal terms with other such culturally contingent forms of discourse, genuinely scientific. In our own intellectually, culturally, and politically quite different time, there is still something to be learnt from Bandung's remarkable scholarly efflorescence half a century or more ago.

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