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THE

CLIO

METRICS

SOCIETY

## Report on 1987 ESRC Quantitive Economic History Conference

*by James Foreman-Peck*  
(University of Newcastle upon Tyne)

NEWCASTLE UPON TYNE - The majority of the twelve papers presented at the September ESRC meetings dealt with aspects of the British economy in the late nineteenth century. Exceptions were contributions discussing medaeval productivity, nineteenth century Portuguese migration, and French business history from the 1880s. Techniques on display ranged from perfect equilibrium games, vector autoregressive models, cointegration, spectral analysis and logit regression to the use of identities as a data consistency check. A generally approved innovation was the introduction of discussants. Whereas last year's presenters of economic history papers showed a high propensity to begin with the announcement that they were not economic historians, this year's discussants were inclined to say they knew nothing of the topic before giving incisive and well-informed appraisals of the papers.

Gunnar Persson (Copenhagen) offered a method for measuring labour productivity in the medaeval agrarian sector that needed comparatively limited amounts of empirical information. Persson's model has three classes and two producing sectors, agrarian and urban. There is an elite consisting of landholders, their soldiers, servants and officials, who receive rents from the second class, agrarian producers. The third class is the urban producers. At the core of the model is an agrarian goods consumption function. Increased labour productivity affects the proportion of the population urbanised according to the marginal propensity to consume agrarian goods and the distribution of income. If a change in urbanization is observed, then changes in productivity may be inferred, once the consumption functions have been estimated and changes in the distribution of income have been controlled. Persson concluded that for plausible parameter values there were significant increases in labour productivity in the expansion phase of the European medaeval economy and presumably, an important though less marked increase in peasant net income. Persson was questioned as to how the results would be affected, if at all, by allowing for intermediate output by the agricultural sector, by changes in the dependency ratio such as occur when population growth accelerates or decelerates, given that the labour force is treated as a proxy for population, and why there was no explicit allowance for the terms of trade between the agrarian and urban sectors.

Arno Kitts and Ian Diamond (Southampton University) attempted to identify changes in the level and structure of emigration from the Alto Minho during the

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## First Clio Sessions at ASSA Well Received

CHICAGO - Despite a blizzard on the first day, the four Cliometrics sessions that were part of the Allied Social Science Association annual meetings were well attended and quite lively. Our format worked well; in the spirit of Clio, many members came ready to discuss and ask questions. On the evening of the second day we had a party where 30 to 40 members and friends enjoyed spirited discussion and a few beers.

As this was Clio's first time at these meetings, we learned a few things. First, that we are not going to attract very many people to our sessions who are not economic historians. It appears that in order to reach a larger audience we will need to have a joint session similar to the one organized by William Parker in Dallas (that has since been published as *Economic History and the Modern Economist.*, edited by Bill). However, many felt that the semi-workshop nature of our sessions was preferred by many.

Second, we learned that Lou Cain and I overestimated the amount of beer that Cliometricians would consume. For those who were concerned, we were able to return the extra beer and soft drinks and get a refund.

Given this year's success, everyone felt that we should continue to have sessions at the ASSA meetings. For now, the format will remain the same. Though many more excellent papers were

submitted than accepted, it was felt that more than the four sessions would be spreading ourselves too thin. I would appreciate your comments and suggestions on changes and improvements for these meetings.

This coming December we (and ASSA) will be in New York. I am pleased to announce that Gary Libecap and Hank Gemery have agreed to be the Program Committee for these sessions. For those interested in presenting a paper at New York, see back page.

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## Second World Congress Set for June 1989

Plans are progressing well for the Second World Congress of Cliometrics. An international steering committee is being formed, and attempts to raise funds from several sources are proceeding.

It is the current plan to hold the Congress in Spain, probably starting on Saturday, June 24th, and continuing until the following Tuesday or Wednesday. Leandro Prodos is working hard to raise funds to support meals, lodging, and other local costs. Two or three sites are being considered.

Starting on a Saturday will be advantageous for attendees from other continents, as in many cases mid-week air fares are quite a bit lower than on the weekend. The dates were chosen because it should be after the end of term for those in the Northern Hemisphere, and during winter break for some of our colleagues from the South.

All cliometricians (and fellow travelers) who wish to attend will be welcome. Efforts are being made to provide travel assistance to those who need it, with groups in different counties trying to raise funds.

For those from the United States, we will try to provide travel grants for most participants. It is not expected that we will be able to cover all costs. The criteria will be to help first the younger members, those who could not otherwise attend, and those who have demonstrated that they have exhausted alternative sources of funds.

Please circle the dates on your calendar, and look for more information in the next Newsletter. If you have any questions or suggestions, please contact the Society's office.

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## Why did the European Peninsulas Develop Differently? A Conference Report

by Joel Mokyr  
(Northwestern University)

ALCALA DE HENARES, SPAIN - An international conference on "The Economic Development of Southern Europe: Italy and Spain 1860-1986" met December 16-18 near Madrid. The conference was organized by Professors Leandro Prados and César Molinas, and sponsored by four Spanish banks. The conference was attended by almost fifty scholars from half a dozen countries, including the U.S., Canada, Britain, Italy, Spain, Portugal, and Germany. The conference was bilingual, with simultaneous translation from Spanish into English and back, which is a first in the Annals of Cliometrics as far as this Rapporteur is aware.

The conference was concerned with a number of basic issues. One was whether there existed something which could be called a "Latin pattern of development," a set of characteristics which distinguished the Iberian countries and Italy from countries across the Pyrenees and the Alps. A second *motif* concerned the question of the relative backwardness of Southern Europe, the slowness of industrialization, and the low productivity of its agriculture and manufacturing sectors compared with other countries.

A third theme of the conference dealt with the impact of various factors on the economies, such as government policies, free trade, geographical elements, land tenure, and the particular political conditions in the two countries after 1945.

Although, as might be expected, not much of a consensus was reached, the conference was a remarkable success in that it was conducted thoroughly in a comparative framework, in which the experiences of Italy and Spain were continuously juxtaposed so that both the differences and common features were highlighted. Among the most prominent common characteristics were similar

locations, a "Mediterranean-style" agriculture, a North-South gradient of development, the background of a rather oppressive Catholic tradition, the impact of twentieth century fascism, and quite rapid industrial growth after 1945. The differences were primarily the much slower economic development of Spain, the greater degree of openness and diversification in Italy, and its much faster catching up with Western Europe after 1900. Spain's development was particularly slowed down after 1945 by thirty years of mismanagement by the misguided and often incompetent policies of the Franco regime, as pointed out with eloquence by Carlos Barciela.



The Conference Participants Gather after Lunch at Sigüenza Castle.

Quite a few of the papers dealt with the computation and re-computation of a variety of statistical measures pertinent to long term economic change. Among those were Albert Carreras' new estimates of Spanish GDP, Leandro Prados' quantitative investigation of Spanish foreign trade, and Vera Zamagni's detailed investigation of the Italian labor force. Others were concerned with the quantitative dimensions of foreign trade, trying to assess the damages of protection, and the importance of export demand for the growth of industry. For the case of

Spain, a detailed analysis was presented by Antonio Tena, while for Italy a parallel picture was drawn by Giovanni Federico for the nineteenth century and Giuseppe Tattara for the twentieth. Other issues that dealt with the two countries in an international context were raised by veteran Cliometrician Stefano Fenoaltea who drew a connection between changes in the supply of British capital and the Italian business cycle, and Pedro Fraile who pointed to the importance of Britain and Germany as markets for industrial products from the periphery. Alan Milward examined differences in Southern European export patterns after 1950 and their impact on economic development.

Another set of papers dealt with agriculture. James Simpson presented an analysis of Spanish agricultural productivity and its breakdown by region and crop between 1874 and 1935. Jordi Palafox argued that Spanish agricultural growth was largely an artefact of protection between 1891-1914. Carlos San Juan presented estimates of changes in the capital stock of Spain in recent decades. Jon Cohen and Francesco Galassi tried to measure the impact of land tenure variables on Italian output, and argued that these variables were probably unimportant.

A number of papers tried to place Spain in an explicitly comparative European context. In a paper utilizing an explicit model, Leandro Prados and César Molinas showed that Italy conformed far more to the European pattern than Spain did, and that there was no "Latin pattern." Similar conclusions using a more traditional mode of economic history were reached by Ivan Berend from Budapest, while quite different conclusions were reached by Gabrielle Tortella. More specific in their topics were papers by Rafael Myro on the evolution of productivity in Spanish industry after 1945, compared with other OECD nations, and Peter Hertner's comparative industry studies on electrification and its connection with foreign capital.

Finally, a number of papers dealt with some specific topics which supplemented the main themes of the conference. Among these were a paper on Spanish population by Roser Nicolau, on the Spanish public sector by Francisco Comin, and one by Juan Jiménez on the Spanish Banco de Crédito Industrial.

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## ESRC Conference (cont. from page 1)

second half of the nineteenth century. They identified emigrant characteristics from the passports

issued and compared them with those of the population from which the emigrants were drawn. Clandestine immigration was investigated by means of a simple model of population change. Throughout the period the wealthier sectors of society, landowners and those engaged in commerce, were far more likely to emigrate. Clandestine emigration rose to very high levels between 1864/1878 and 1878/1890 and then virtually disappeared.

Cormac O'Grada raised a series of questions drawn from the analogy with Ireland. Why did so few Portuguese women migrate and why were the males that moved older? The Portuguese went only to Brazil but the Irish went all over the world. Analogous with Ireland was the problem of missing illegal emigrants, corresponding with the Irish possibility of under-enumeration, both of which could create difficulties in interpreting the statistical analysis. In reply Kitts referred to the Portuguese naval tradition which made the long temporary absence of males acceptable. The trade connection with Brazil accounted for the destinations of migrants. Nicholas suggested the analysis could be seen as measuring the contribution of human capital characteristics to the probability of moving. The linguistic link with Brazil accounted in part for the destination of migrants but, as Mitchell pointed out, there were other Portuguese-speaking areas to which emigrants might have gone.

In earlier work Humphrey Southall (Queen Mary, London) found regional unemployment as measured by Trade Union data was similar before the First World War to levels observed afterwards. Since the coverage of that source was limited he had now turned to Poor Law statistics for further evidence. When detrended and smoothed the Poor Law series resembled the trade union data, with a similar power spectrum. Southall aimed to isolate the cyclical components and the regional patterns. He employed stepwise regression to identify the sources of pauperdom and concluded from the explanatory power of his trend variable that the policy of individual Boards of Guardians was the major factor. He concluded that the Poor Law data were consistent with his earlier findings. Paul Johnson pointed out that Mary MacKinnon's policy-constant series of pauper statistics implied conclusions about the cycle similar to Southall's. However, he went on to ask whether we ought to expect similar behaviour of the Poor Law and Trade Union series, since even in depressions only 5% of the population was in receipt of relief and most of those were not able-bodied males. Southall remarked that there were riots in Blackburn in 1868/9 over the Guardian's

policy and therefore a considerable number of able-bodied males must have thought themselves eligible for relief. Paul Johnson noted that the proportion of able-bodied males on relief was high in agricultural areas and conjectured that some might judge this to be the operation of a wage subsidy encouraging the emergence of a welfare mentality, in turn reducing the stigma from accepting relief.

Charles Feinstein's (Oxford) paper originated in concern that Edwardian national income and expenditure estimates were rather low and focussed on the real wage per worker component of these estimates. Feinstein decomposed an identity as a consistency check, to discover the source of divergence between the real wage and labour productivity growth. The real wage change emerged as abrupt. Money wages diverged from the cost of living perhaps because of a failure of trade union bargaining power. But was that consistent with our knowledge of the period? Bowley's wage series, which generated this result, suffered from considerable problems which Feinstein attempted to rectify. Feinstein repeated his earlier exercise with the new data separating the movement between and within occupations. He found the changes within occupations between the periods 1882-99 and 1899-1913 indicated an increase in wage growth from 1/2% p.a. to 1% p.a. when price rises were reflected in wage bargaining. Shifts between occupations showed a decline. Structural change was making a smaller contribution to wage growth, perhaps because of the diminished weight of agriculture. Feinstein's final results showed an Edwardian increase in real employment income of 0.6% p.a., a turnaround of about 1 1/2%, instead of 2 1/2%, to a decline of -1/2% p.a., as the earlier figures suggested. Ian Gazely's discussion ranged across the unrepresentativeness for the working classes of Wood's London prices, and possible extensions of the analysis to north-south and rural-urban differentials. Others raised the drink problem and the terms of trade effect. Feinstein mentioned that, contrary to W.A. Lewis' work, the terms of trade influence on the cost of living was very small.

John Treble (Hull) examined why arbitrated settlements in the late nineteenth century British coal industry differed among areas. Because verbatim records of the offers and counter offers survived, Treble saw this as an opportunity to formulate an explanation in terms of perfect equilibrium game theory. Perfect equilibrium games are games with stages in which the players look ahead, asking themselves what are the Nash equilibria (equilibria at which all parties have no incentive to change) and

work back through each stage until they determine their current decision. Coal industry arbitration conformed to this pattern, being subject to a set of rules established for a three year period under which wage negotiations took place every quarter. Although the rules could be changed, they rarely were, implying that the parties found them broadly acceptable. Treble set out to analyse the frequency of resort to the arbitrator in terms of the nature of the rules.

The terms of the sliding-scale linking coal prices and wage rates were the subject of the negotiation. In some jurisdictions, settlement could be deferred when coal prices fell so as to maintain wages. Then if coal prices rose employers delayed and the arbitrator was called in. Three jurisdictions - Federation, Scotland and Durham - had the smallest rate of appeal to arbitration. Northumberland and South Wales could not delay and therefore appealed frequently.

Peter Solar pointed out that the paper provided data only on the process and not on the outcome. He wanted to know how wages were affected. The direction and magnitude of price movements, the spread of offers, and resort to arbitrators should be investigated. Perhaps an abundance of facts reduced the interest in a problem for a theorist because he lost degrees of freedom.

Solar was unable to see where the extensive form of the game entered. He also wanted to know how the theory could be tested. Southall raised the issue of what light the paper shed on the evolution of wage bargaining and the disappearance of the sliding scale. Treble rejoined that Northumberland returned to the sliding scale in 1913. The difference was that the new scale had limits, unlike the old. There was a discussion of the extent to which arbitration was self-contained. Treble said that reference to agreements in other coal fields was always rejected as a basis for comparison. There were never any strikes or lockouts over conciliation board decisions. Price lists were the principal bone of contention.

Barjot's (Caen) paper demonstrated the potential for business history of INSEE's accounting conventions, the système intermédiaire entreprises, that could be employed at the level of the firm and linked to national income concepts. The approach was applied to the Société des Grands Travaux de Marseille, a firm whose birth was caused by the Marseille cholera outbreak of 1886. The mayor of Marseilles supported the establishment of a company to build a new sewage system. The company then grew on the basis of export contracts

until the war. A dam for hydroelectricity in the Pyrenees marked the beginning of a diversification strategy, but the inter-war years were a period of profitable retrenchment rather than growth.

Tim Hatton (Essex) asked whether anything could be said about what profit-sharing schemes ought to deliver and why the Victorians' efforts in this area generally failed. The first notable scheme was established by Henry Briggs in 1865. Unfortunately, there is no data on profits for each firm in the Board of Trade reports. The reports do, however, give data on the survival of schemes and the reasons for their abandonment. Of 288 schemes, 133 continued to exist in 1912. Hatton employed a hazard function to identify the characteristics that influenced the chances of a scheme surviving. He found that industry effects were small but he was surprised that the hazard function was upwards sloping; the chances of a scheme surviving decreased the longer the scheme had been in existence. Brian Mitchell suggested the small number of Victorian firms adopting profit-sharing schemes was the best indicator of their usefulness and success. Survival may have depended more on ideology than utility. He proposed that the 'wearing off' effect may have been a consequence of profit fluctuations; when profits were low schemes were abandoned. After 1875 Briggs would have paid nothing until 1891 and again nothing for 1893-1900, for 1903-1906 and 1909-11, had profit sharing been maintained. Treble drew the conference's attention to Captain Ahab and Peleg in *Moby Dick*; whaling and fishing vessels typically offered their crews a share in the venture, a form of loss sharing as well as profit sharing, analysed by Sutinen in the *Scottish Journal of Political Economy* (1979). Hatton pointed out such arrangements were specifically ruled out by the Board of Trade's definition.

John Cantwell (Reading) computed a revealed technological advantage (RTA) index for 13 countries and 27 industries for the periods 1890-92, 1910-12 and 1963-83 from 18,000 US patents granted to residents of the major countries of origin. He employed his indices to examine the extent to which the pattern of technological innovation remains stable, drawing upon Pavitt's theory of technological accumulation. The method was to regress the cross-section RTA indices upon the lagged values of the same measures. These equations give rise to 'mobility' and 'specialisation' effects measured by the regression coefficient  $\beta$  and the relationship between  $\beta^2$  and the  $R^2$  of the equation, respectively. The mobility effect is the extent to which some industries are moving together and others further

apart, possibly to the extent of changing their ranking (in terms of the RTA index), measured by  $R^2$ . Technological specialisation is indicated by the variance of the RTA index. A high variance suggests high specialisation, and the level of specialisation increases when  $\beta^2 > R^2$ . British firms appear to have maintained a strong technological advantage in cleaning agents, industrial engines and turbines, shipbuilding, textiles, rubber products (tyres), and coal and petroleum products. German firms held a favourable position in chemicals in general, but especially in dyestuffs and paints, and in lighting and wiring equipment. Pascal Griset suggested that Cantwell's high RTA index for the Italian radio industry for 1890-1912 may have been a misclassification of some of the Marconi patents. Foreman-Peck remarked that predicting a variable in one period in terms of the value of that variable in an earlier period could give accurate results, but provided no explanation for the outcome because it did not constitute a theory. There was a lengthy discussion about the role of multinationals in generating patent statistics in view of their tendency, until recently, to centralise research and development.

Stephen Nicholas (New South Wales) compiled a sample of 448 British multinational enterprises operating before 1939. Case study material suggested overseas investment of British firms tended to be concentrated in a small number of years. This bunching was also observed in the full sample in which 26% of the firms with three or more overseas plants undertook the investments with gaps of no more than 1-3 years. Three hundred and eighty of the sample could be identified as having either a production branch or a sales branch only. Nicholas attributed the pattern to scope economies in managerial knowledge. These firms were then subject to logit analysis to determine the location, transaction, and production cost variables which influenced the choice of contractual arrangement. The geographic distribution of the full sample showed that 28% of the FDI in production plants before 1914 was in the developed Empire, compared with 23% in developed Europe and 20% in underdeveloped Europe. After 1914 the pattern altered to further favour the developed Empire. Logit analysis emphasized tariffs, political risks and language as key determinants of where the FDI was undertaken. The Empire, Nicholas concluded, provided economic advantages for competitive British multinationals; it was not a market of the last resort for inefficient British firms.

Tony Corley wondered whether Nicholas's strictures on the case method applied also to his sample;

both were biased by the exclusion of unsuccessful firms. Nicholas was asked how his diversification and raw materials variables were related to transactions costs and whether they were really size proxies. He replied that 'diversification' measured scope economics. It was conjectured that Nicholas's Psychic/language variable was in fact equivalent to an Empire variable, with the exception of the United States. Food/Drink, a significant negative industry dummy variable in location analysis, might reflect large volume, low value goods manufactured at the point of sale. Were such dummies, it was asked, in fact identifying transport costs of the product as an influence on the location decision? Nicholas replied that distance did not seem to have any independent explanatory power and that should have proxied transport costs.

Geoffrey Wood (City) and Terry Mills (Leeds) considered the impact of money growth on interest rates in the UK from 1870 to 1913 using a vector ARMA model. They constructed multiple time series models for money, output, interest rates and prices to allow detailed hypothesis testing and dynamic testing to be carried out. Twenty six parameters (16 autoregressive coefficients plus 10 contemporaneous covariances) were estimated from 43 observations. Inevitably, individual coefficients were often imprecisely estimated; therefore direct interpretation of models was supplemented by examinations of innovation accounting decompositions and impulse response functions. Mills and Wood found that the United Kingdom under the gold standard did not behave as a small open economy; prices, interest rates, money and output were in fact all jointly determined. One curious result was that M3 was purely passive in models using Feinstein's output and price series whereas M0 was both influenced by, and itself influenced, output. Money growth did affect interest rates and did produce a Fisher effect.

Mark Taylor cited Engle and Grainger in *Econometrica* 1987 to the effect that if a relationship between variables existed, the two variables must be cointegrated, but there must also be an error correction representation. Since Mills and Wood omitted error correction terms from their models, either there was no relationship between their variables or all the equations were mis-specified. Wood rejoined that the error correction mechanisms had been tested and found insignificant and, in response to another question, pointed out that foreign influences on the UK economy were captured in his model by changes in the gold base.

Tessa Ogden (City) examined the Bank of England's behaviour during the years 1870-1914 in order to ascertain whether and when changes in 'lender of the last resort' policy occurred. The archives of the Bank are either noncommittal on most major policy aspects or not open to the public. Therefore, considerable weight has to be placed on indirect, statistical evidence. A polynomial trend was fitted to weekly Bank of England discounts or advances for subperiods of 1870-1914 in order to identify periods of abnormal demand for facilities. The residuals from these regressions were then plotted against one, two and three standard deviations. Any observation exceeding two or three standard deviations counted as a period of abnormal activity. Only five out of 26 outliers could be accounted for by recognised financial crises. This lack of correspondence might be explained in part by the lack of continuity in policy stemming from the short, two year period of office that was assigned to Governors. Primary sources indicated that the then Governor, Lidderdale, organised the guarantee that allowed Baring's to survive the 1890 crisis. Perhaps with a different Governor, lacking Lidderdale's commitment, there would have been no intervention. Steve Broadberry suggested that the problem was similar to testing for stock market bubbles. Alternatively, a runs test could be conducted to identify policy intervention.

Paul Turner's (Southampton) study of the demand for money 1870-1980 employed 'cointegration' techniques and found that the M3 velocity of circulation was stable in the period 1870-1914, but was not for the interwar years and the period 1946-1980. In view of the changes in the banking structure, with the rise of the joint stock banks in the last decades of the nineteenth century, this result was rather surprising. The method of cointegration is concerned with the error process of an equilibrium relation. If a relationship is genuinely an equilibrium, then the errors will follow a random walk. To test for stability, the change in the error is regressed on the lagged change in the error and the level of the lagged error. A t-statistic on the lag coefficient tested for drift and the Durbin-Watson statistic tested for a random walk. Turner tried widening the definition of money to include Building Society and savings deposits, but his results were similar to those obtained with his narrower M3. Kent Matthews pointed out that estimate of the income elasticity for the third period was quite implausible, perhaps because of the spread of cash management techniques and innovations such as Competition and

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## Conferencing On and Off the Rails in California

by Roger L. Ransom  
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SACRAMENTO- On November 13-15, 1987, the California State Railroad Museum in Sacramento hosted more than 60 scholars attending the conference on "Railroads and Economic Development," organized by the University of California Intercampus Group in Economic History. While museum visitors wandered among the locomotives and other train paraphernalia, scholars listened to 13 papers discussing the impact of the iron horse on economic life over the past 150 years.

The Conference opened on an international note. We heard Miguel Tinker Salas on the impact of rail development in northern Mexico, "In the Shadow of the Eagle: Society and Commerce in Sonora, 1850-1900," after which James Foreman-Peck gave us some insights on Britain, "Natural Monopoly and British Railway Policy in the Nineteenth Century." These papers were followed by a discussion of the Indian railways in the nineteenth century led by Eric Gustafson, "The Gift of an Elephant: The Indian Guaranteed Railways, 1845- 1870," and Tara Sethia, "Berar and the Nizam's State Railway: Conflicting British Interests in Hyderabad."

Two themes ranged through the presentation and discussion of these papers. One was the problem of natural monopoly and the role of the state, a theme that was to recur throughout the conference. The other was the manner in which political factors were often as prominent in decisions to operate railroads as economic factors. Commenting on "the largely unregulated free- enterprise system of railway investment" in Britain, Foreman-Peck concluded that it "probably raised construction costs by 50%." His claim that a "more interventionist" regime of management would have produced greater efficiency was based on an comparison of data for Britain with costs for other "state- operated" systems on the continent. This was met with the usual skepticism borne from many years of hearing arguments that a counterfactual state could have supplied superior management than the observed entrepreneur.

An absence of state intervention was hardly the problem in India. Here the problem was that political interests affected the financing and construction of railroads. What made the problem more severe was the competing aims of two states: the local Indian government and the British colonial regime. Sethia and Gustafson argued that the British used the railways to further their own military and

economic aims. Sethia's paper was a particularly intriguing story of efforts by the state of Nizam to overcome British resistance to construction of a railroad which would link that state with major international markets. In Mexico the foreign presence was less direct, though perhaps even more sinister. Tinker Salas argued that the construction of railroad ties between Sonora and the United States fundamentally altered the political and economic structure of Sonora, and redirected the ties which that state had with the international trading community.

The heartland of American railroad folklore is the western United States. Seven conference papers concentrated on the western railroads -- five of them focusing on the Union and Southern Pacific lines. Maury Klein told us that the stereotype of Jay Gould, one of the great "villains" of railroad history, as a reckless speculator with no thought of the longer-term interests of his companies, was grossly inaccurate [in "Jay Gould: System Builder." "Those who think E.H. Harriman pioneered in the idea of merging the Union Pacific, Central Pacific, and Southern Pacific," he noted, "will be surprised to learn that Gould had the idea a quarter of a century earlier." While not everyone was ready to accept Jay Gould as a visionary who pioneered railroads in the West, most were prepared to concede that poor ol' Jay had been given an unfair press by railroad historians.

Lloyd Mercer then chronicled E.H. Harriman's unsuccessful attempt to merge the two great western rail systems, "The Courts and the Union Pacific-Southern Pacific Merger." Mercer and Don Hoff-sommer, in "The Government and the S.P. in the Twentieth Century," bemoaned the failure of the courts -- most notably the United States Supreme Court -- to understand why the intricacies of railroad finance and management necessitated conglomeration. The prevailing sentiment in the audience was that the government's case against the merger was indeed rather weak, a conclusion which brought us back to the question of natural monopoly and the role of the state. This time opponents of state control favored a counterfactual of "the company knows best." One is left to wonder what might have happened if Jay Gould and the Southern Pacific Railroad had been given free rein to develop the railroad network in Great Britain.



Another presenter who was less than enthralled by the performance of the government in regulating the railroads was Tony O'Brien, "The I.C.C., Freight Rates, and the Great Depression." The ICC, according to O'Brien, "appears to have significantly increased the severity of the Great Depression" through its regulatory policy which, by stressing the need to maintain a return for the railroads, increased the volatility of rates. O'Brien's paper was an interesting example of resurrecting old arguments in new garb; Jacob Viner had made the same point more than fifty years ago.

Richard Orsi dealt with a very different facet of the S.P.'s activity: its commitment "to the principle of public water management" in "Railroads and Water in the Arid Far West: The Southern Pacific Company as a Pioneer Water Developer." While Orsi made a convincing case that the S.P. was involved with numerous water projects in the California desert, he was somewhat less successful in showing that there was a "principle" of public water management working here. The railroad was into water management because they needed water for the steam engines or because they hoped to increase rents from the lands adjacent to the roadbed. If there was "public management," it was for "private gain."

In the other two papers dealing with western railroads, Jim Shepherd looked at the rail and water competition along the Columbia River toward the end of the nineteenth century in "Railroads and Northwest Farms," while Greg Thompson examined the decline of passenger traffic in the twentieth century, "The Declining Impact of the Passenger Train in California, 1910-1941." In each case the author presented a detailed analysis of the manner in which rail service -- by its appearance or by its disappearance -- could influence the economic activity of a region.

In one of the most interesting sessions of the conference, Bill Sundstrum's "The Strange Career of Black Locomotive Firemen: Race and the Internal Labor Markets of Southern Railroads" and Sam Williamson's "The Development of Pensions in Railroads," looked at railroads and labor using models of "internal labor markets." Sundstrum found that southern railroads hired substantial numbers of blacks and allowed them to climb the "job ladder" to become brakemen and firemen. Blacks were excluded, however, from supervisory positions such as engineers, conductors, foremen, or switchmen. Williamson argued that railroads were the first to introduce pensions "because they were the first modern corporation with a hierarchical

organizational structure" capable of developing a systematic personnel system that included seniority, mandatory retirement, and pensions. What made this session interesting is that it was the only time that the *organizational aspects* of railroad history -- which have received so much attention in recent years -- were the focus of discussion at the conference.

Three papers - "Standardization of Railway Gauge in Britain and America" by Douglas Puffert, "Output Decisions in Two Stage Duopoly Theory: The Case of Pacific Mail and Union and Central Pacific" by Don Hoban, and "Railroads and the People: The Los Angeles Harbor Fight" by William Deverell - were presented in a Poster Session on Saturday afternoon.

As usual, one of the conference highlights was the banquet; this one held in the main hall of the Railroad Museum. Seated amid railroad behemoths of a bygone age, we listened to Albert Fishlow pose the question "What Have We Learned About Railroads in 25 Years?" The answer is, unless I completely missed Albert's point, "not a whole lot." Twenty-five years ago those who studied the "revolution" brought about by the introduction of railroads were in the vanguard of the "New Economic History." Judged by the papers presented at Sacramento, that is no longer the case. To be sure, the speakers showed great enthusiasm and the papers contained much detail on the operations of railroads. But, like the railroads they studied, many of the arguments had the appearance of one who is unsuccessfully struggling to compete with more glamorous competitors. The questions had been asked before, and the answers were not surprising. If one were looking for new intellectual vistas to conquer, there were few to be found in these papers.

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### ESRC Conference (cont. from page 7)

Credit Control. Foreman-Peck suggested the decline of the Inland Bill, to which Nishimura drew our attention, may have offset the impact of the rise of the joint stock banks. Turner agreed that this was worth looking at, since every other country he had considered showed a falling velocity of circulation in the Victorian period, except for Britain.

*Additional financial support for the conference was provided by the British Academy.*

## Third Biennial ANU Economics History Conference

by Lee J. Alston  
(Williams College)

CANBERRA, AUSTRALIA - The Third Biennial ANU Economic History Conference was judged a great success - at least by its organizers David Pope (The Australian National University) and Lee Alston (visiting at ANU). The conference was held September 4-6, 1987 in Canberra at The Australian National University. The conference theme was Human Resources in Australian History. Abstracts of papers appear in Section II.

Participants came from four continents (beat that, Clio!) and represented the disciplines of demography, economic history, economics, history and sociology. Participants also came from the Australian public service and private banking sector. To help generate lively debate a la Clio, participation was limited to 40 people. In addition to being intellectually stimulating, a good time was had by all, thanks to local hospitality arranged by David Pope.

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### Retrospect & Prospect: The State of Agricultural History

by Fred V. Carstensen  
(University of Connecticut)

Wayne Rasmussen has, for nearly fifty years, played a remarkable role in shaping and promoting the study of agricultural history. From 1937 to 1986, Wayne worked at the U.S. Department of Agriculture where he encouraged and supported many aspiring economists and historians by hiring them to work as summer interns in his Agricultural History Office of the USDA Economic Research Service. Wayne was and is a mainstay of the Agricultural History Society.

On October 17, 1987, about 60 historians, economists, and other scholars gathered in Washington, D.C. for a one-day conference honoring Wayne, seeking to recognize his unique contribution in shaping the field by asking leading scholars to comment on the state and prospect of agricultural history. James Shideler, long-time editor of *Agricultural History*, and Gavin Wright offered up two excellent commentaries on the evolution of the field and the range of research issues which it should now address. Gavin focused on three traditional areas - 1) productivity change, 2) institutions,

and 3) markets and communities. He offered perceptive criticisms of the accepted conceptual frameworks and interpretations, arguing for a new set of interpretive approaches. Al Bogue's comments expanded the range of issues and even suggested some unexplored data sets which scholars might use productively. Hal Barron followed with a commentary on how agricultural history can and perhaps ought to be recast within the framework of rural history - the "new" social history as applied to the non-urban environment. Margaret Bogue offered an energetic and perceptive defense of traditional methodological approaches.

In the afternoon Jeremy Atack, Fred Bateman, and Pete Daniel presented their respective views on the states of agricultural history, North and South. The final panel of Hal Woodman and Robert McMath offered two different perspectives on the state of agricultural history - treating agriculture as enterprise history on the one hand, and viewing it within the framework of the history of technological evolution on the other. Judith Klein and Robert Evenson commented on the papers.

These papers will be brought together in a single volume in the Henry Wallace series from the Iowa State University Press, thereby reaching a wider audience with their illuminating commentary on the state of agricultural history and their rich banquet of research ideas.

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### Report of Publications from Clio Conferences

Some reviewers of last year's NSF proposal asked for information on what has become of work presented at Cliometrics Conferences in the past. To get an answer, a letter asking for an accounting of papers was sent to 84 scholars who had presented between 1979 and 1986. Replies were received from 56 people, and the results were:

Published in a Journal - 47  
    Already out - 35  
    Forthcoming - 12  
Part of a larger work (book, monograph, etc.) - 22  
    Already out - 7  
    Forthcoming - 15  
Still in progress toward publication - 13  
TOTAL - 82

*Note: Total exceeds number of replies (56) due to multiple attendance and because some papers were the basis of several different publications.*

# CLASSIFIEDS

The deadline for submissions to the June Newsletter is May 20th.

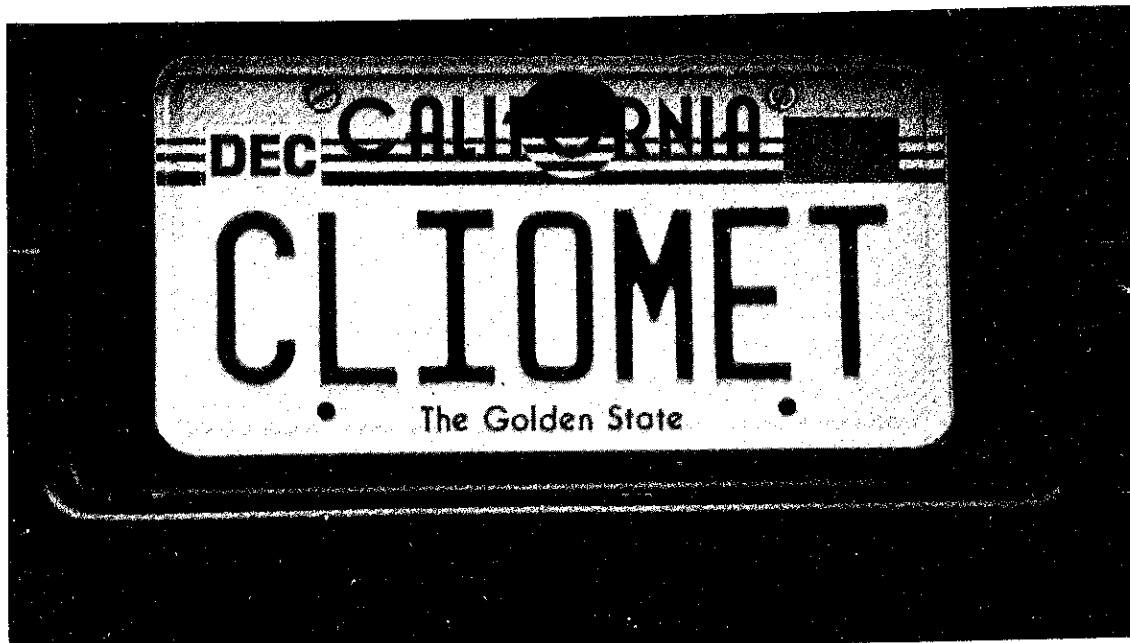
**FOR THE CONSUMMATE CLIOMETRICIAN** -- Roger Ransom, trend-setter that he is, has created a new level of loyalty to Clio by having a "vanity" license plate (pictured below) made for his automobile. It has been suggested that those in other states and countries might want to get the same (or some variant) plate for themselves. When and if you do please send us a picture.

**ANNOUNCEMENT** -- A "B Session" will be held at the International Economic History Association Meetings in 1990 on the topic **Unemployment and Underemployment in Historical Perspective**. Persons interested in participating should describe their proposed paper in a letter to the session chair, Barry Eichengreen, Department of Economics, University of California, Berkeley, CA 94720 USA, who would be particularly pleased to receive prospectuses for papers on regions *other than* North America and Western Europe and on periods *other than* the interwar years.

**RESEARCH QUERY**--Anyone who is interested in the US silk (textile) industry at the beginning of the 20th century, please contact me. I am especially interested in the American demand and market for Italian silk: Giovanni Federico, Dipartimento Storia Moderna, Piazza Torricelli 2, 56100 Pisa, Italy.

**ANNOUNCEMENT** -- Cambridge University Press has appointed Michael D. Bordo and Forrest Capie as editors of a new series of books in monetary and financial history. The editors are soliciting manuscripts for this series. You can write to Bordo at: Graduate School of Industrial Administration, Carnegie Mellon University, Schenley Park, Pittsburgh, PA 15213-3890.

**CALL FOR PAPERS** - There is still time to submit paper proposals for the next All-UC Conference to be held at Santa Cruz on April 29-May 1, 1988. The Conference theme is "New Directions in Business History: Industrial Performance and Enterprise." Contact (*as soon as possible*) Bernard Elbaum, Department of Economics, University of California, Santa Cruz, CA 95064; 408 429-2657.



## CALL FOR PAPERS FOR ASSA MEETINGS '88

Anyone interested in presenting a paper at Cliometrics Society sessions at the ASSA meeting in New York, December 28-30, please note the following deadlines. Members are urged to pass this announcement on to their colleagues and students who might want to submit their work.

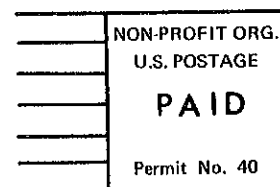
### Deadlines that must be met:

**May 20** - A one-page proposal of your paper is received by Gary D. Libecap, Karl Eller Center, College of Business, University of Arizona, Tucson, AZ 85721 (602 631-2576). You will be notified by June 24 if your paper has been accepted.

**August 30** - An eight-page summary of your paper is received at The Cliometric Society office: Dept. of Economics, Miami University, Oxford, OH 45056 (513 529-2850). This will be published in the October Newsletter.

**December 2** - The final version of your paper is in the hands of the discussants and other members of the session to which you have been assigned.

THE CLIOMETRICS SOCIETY  
DEPARTMENT OF ECONOMICS  
MIAMI UNIVERSITY  
OXFORD, OH 45056



## Section II -- Abstracts

Abstracts from the All-UC Conference in Sacramento, November 13-15, 1988 - "Railroads and Economic Development."

William Deverell (Princeton University), *Railroads and The People: The Los Angeles Harbor Fight*

The Los Angeles "free harbor fight" of the 1890s pitted two railroad companies against one another over the choice of a deep-water harbor in the region. The Southern Pacific Railroad lobbied for Santa Monica and the Terminal Railway pushed for San Pedro.

The harbor fight has most often been seen as a vindication of "the people," a collective triumph over the power and influence of the S.P. Yet closer scrutiny reveals that the issue was more complex than this near-morality play analysis would suggest. Clever manipulation of public opinion and prejudice by those favoring San Pedro helped to convince Congress that the harbor ought to be developed in San Pedro. Using opposition to the S.P. as an effective rallying cry, San Pedro's supporters were able to disguise their considerable self-interest in the matter. In this way, competition between business elites was masked as proto-Progressive reform.

Donald Hofstommer *The Government and the S.P. in the Twentieth Century*

Much speculation has surrounded the recent circumstance of the Southern Pacific Company. Perceived by some as the "new standard railroad" of the country during the mid-1960s, the S.P. fell on hard times thereafter, lost its balance, and tumbled into a merger with Santa Fe Industries. Combination of S.P.'s railroads with the AT&SF failed, however, to gain approval of the Interstate Commerce Commission. Several theories have been advanced, but nothing is more important in understanding S.P.'s fate than events of many years ago - when well-intentioned government meddling dissolved S.P.'s unification with the Union Pacific and even sought to separate the vital Central Pacific from the S.P. The entire episode stretched over 15 years, thoroughly distracted S.P.'s managers, and prevented the company from prosecuting its advantages. Evil and bitter-tasting fruit would not ripen until the 1970s and 1980s.

Anthony O'Brien (Lehigh University), *The I.C.C., Freight Rates, and the Great Depression*

As the Interstate Commerce Commission gained increasing control over freight rates after 1903, it at first increased their stability. After 1920, however, the attempt to guarantee rates of return to the railways caused the Commission to adopt policies that sharply increased the volatility of real freight rates and made movements in them strongly pro-cyclical. One consequence of this was to make the Great Depression more severe than it would otherwise have been.

Samuel H. Williamson (Miami University), *The Development of Pensions for Railroad Workers*

Railroads were the first "modern" business enterprises, with complex and hierarchical management structure. While this had important organizational benefits it also allowed for capricious treatment by lower-level management of an increasingly skilled labor force. In attempts to deal with labor unrest, railroads introduced various fringe benefits including pensions. At the same time workers organized brotherhoods to negotiate for strong seniority rules in their contracts. Whereas the pensions had originally been designed to reward the disabled and long serving superannuated worker, it evolved into a tool to impose mandatory retirement and move out the higher paid (by reason of seniority rights) older workers.

Abstracts from The Third Biennial ANU Economic History Conference in Canberra, Australia, September 4-6, 1987 - "Human Resources in Australian History."

Christabel Young (Australian National University), *Life Cycle Experience of Cohorts in the Evolution of Female Labour Force Participation in Australia*

The application of a cohort approach to the analysis of female labour force participation in Australia enables the lifetime work patterns of real generations of women to be traced. In particular, such an approach shows that over successive generations of married women there has been a trend from mostly working only after the children have grown up, to working before childbearing and after the last child starts school, and more recently to working throughout marriage. The analysis suggests that these trends are strongly influenced by changes in legislation which facilitate the combination of work and childbearing. Contrary to common belief, married women working part-time are responsible for only 40 percent of the total growth in the female labour force over the last 20 years, with 31 percent coming from married women working full-time, 15 percent from other women working full-time, and 14 percent from other women working part-time. The study also considers the relative contribution of women and migrants to the growth of the Australian labour force during the post-war years. Among the four groups: Australian-born males, Australian-born females, overseas-born males and overseas-born females, the largest contribution to the total growth in the labour force has come from Australian-born females. In addition, the increasing labour force participation of women since the 1950s has significantly lowered the labour force dependency ration between 1961 and 1981. In contrast, the effect of migration during 1981-2021 on the future dependency ration is relatively slight.

Glenn Withers (La Trobe University), *Immigration and Labour Accumulation*

Australia has long been one of the world's major immigrant countries, both absolutely and, even more, in per capita terms. Immigration has contributed much to Australian population growth and to labour force expansion and thereby to aggregate output growth.

Less clear has been the relationship between immigration and growth of per capita income. This depends upon the complementary expansion of other inputs, the availability of scale economies and the skill levels and labour participation rates of the migrant inflow.

This paper examines the historical interrelation between these elements and accords a primary role to increasing skill levels of immigration (relative to the domestic work force) in contributing to enhanced per capita income and in offsetting the retarding influences over time of reduced scale economies and of increasing dependency ratios, particularly since the Second World War. Problems of factor proportions imbalance are seen as contributing to a reduced contribution to real income growth in the earlier part of the twentieth century.

A feature of the paper is the development of annual estimates of skill distribution and work participation for immigrant inflows over the period 1877 to 1986.

Mary MacKinnon (A.N.U. & Queen's University, Canada), *Schooling in Australia: Examining Some Myths*

This paper examines reasons why, throughout the 20th century, the average Australian has spent fewer years in formal education than the average North American, but about the same amount of time as the average Briton. Leaving school at 14 of 15 was the norm in Australia until the late 1960s. Currently, only about half of Australian adolescents finish secondary school, and this is now a matter of considerable concern to policy makers, with some attributing slow economic growth to inadequate education. Raising participation rates is a policy objective for Australian governments. Typically, the low levels of schooling in the first half of the century have been considered a product of the conditions of a pioneer society, where returns to formal education were low, and it has often been claimed that there was little need for higher educational participation rates because skills were supplied through immigration and apprenticeship. However, if a pioneer society is a rural society, then Australia was less of a pioneer society than Canada or the US, because more of its population lived in cities. Schools in rural Australia were relatively good, and the gap between North American and Australian education levels was largely due to the minimal provision of secondary schools in urban Australia before the 1950s. While the contributions of immigration and apprenticeship have been considerable, they do not raise the stock of skills in the adult population to North American levels. Whatever cultural and economic factors explain the initial international gap in levels of schooling, intergenerational persistence effects are considerable, so that a low rate of convergence is to be expected. Australians have also faced greater supply side constraints than North Americans, with lower growth rates of per capita income for much of this century, and in the postwar period larger and more sustained increases in the school age population. Inadequate capital expenditure has had long term effects in slowing the growth of secondary schooling.

T.J. Hatton (University of Essex) and Bruce Chapman (Australian National University), *Post School Training in Australia 1900-1980*

In this paper we outline the evolution of post school training in Australia since 1900; the causes and consequences of its development. Growth and structural change has increased the demand for skills but this has been modest by international standards: periodic skill shortages reflect excess supply of labour as a whole which were partially offset by immigration. The domestic production of skills was conditioned by the evolution of educational institutions beginning with the reforms which took place in the years before 1914. In the postwar period the growth of further education took the form of overlapping phases of growth; first the universities followed by CAE's in the 1960s and subsequently TAFE. For manual occupations, apprenticeships remained the dominant form of skill acquisition and was institutionalised under arbitration and bolstered by trade unionism. The demand for apprentices varied with economic fluctuations but appears relatively insensitive to changes in the terms of apprenticeship. The final section of the paper examines the effect of different forms of post-school training on earnings using the ANU Social Mobility Survey of 1973. The results indicate a rate of return to years of apprenticeship of 5.6 percent but close to zero for trade qualifications as a whole compared with 7.9 percent for a bachelor's degree.

Jane Marceau (Australian National University), *Skills, Tasks and Technologies: The Use of Human Resources in Australian Business*

The aim of the paper is to shed some light on the ways in which economic organisations use the human resources at their disposal and the ways in which they reward or do not reward possession of credentials earned through success in the formal education system in Australia. Companies vary greatly both in their perceptions of what they 'need' and in the degree to which their own structures and practices can effectively discriminate and reward those who serve them 'best'. Indeed, the criteria for 'best' service are themselves still in a state of flux. Almost all companies, large and small, want both specialists and generalists, but most have not sorted out when they want them to be one or the other. Some of the larger firms, for example, want universities to provide generalists which the companies can then turn into specialists. Others want specialists they can turn into generalists at their leisure, for all face the problem that in divisionalised structures managers must have a global view, balancing competing interests and coordinating a multitude of activities. It is probably at this point that at present Australian companies are weakest. Many are not even aware of the problem. Universities produce business generalists bearing the magic letter MBA after their name, but in Australia at present these do not find many enthusiastic buyers.

David Pope (Australian National University), *Bankers and Banking Business, 1860-1914*

In Australia the largest group of financial intermediaries in the nineteenth century, indeed through to today, has been the trading (commercial) banks. Their numbers were few and concentration ratios high: CR<sub>4</sub> of around 50 per cent, CR<sub>8</sub> of 80 per cent. They possessed the properties of the emergent modern corporation, they were large, publicly owned and managerially run on a hierarchical structure. The paper argues that the market structure--oligopolistic with the prevalent non-price mode of competition being the opening of additional branches--influenced the opportunities, rewards and utilization of bankers' human capital. How did it do this? Banks recruited junior clerks from school and beyond this stage an internal labour market operated (partly due to firm-specific skills and the perceived need for loyalty). The extensive branch networks of the banks (the Australian ratio of offices to population greatly exceeded Scottish, British and North American ratios) was associated with a pyramid structure of clerks at the bottom, accountants, and then at the top, branch managers. The widest earnings gaps between the bottom and the top of these classes were in the 1870s and 1890s. It is argued that this reflected the economic tide. The 1880s were boom years, which resulted in an expansion of branches, mostly in small towns. Managers of these new and smaller branches received less than those of the larger branches so while economic expansion increased the likelihood of junior staff climbing the steps of the pyramid to manage some sort of a branch, it simultaneously compressed pay relativities. The depression of the early 1890s witnessed the shrinkage of branch networks, the small branches closing first, and the reverse process. The paper also investigates how senior bankers challenged conservative English principles of banking, especially in the boom years, and the consequences for the economy and the banks.

Bruce Chapman (Australian National University) and Lee J. Alston (Williams College), *A Tale of Two Cross-Sections: Arbitration and New South Wales Wage Structures in 1905 and 1981*

A major issue in contemporary Australian labour market debate is the consequences of regulation on the wage structure. We examine wages in NSW before and after regulation, in 1905 and 1981. The exercise has been motivated, in part, by the importance of the issue once it is considered in a theoretical context: statistical support for the view that the presence of the arbitration and conciliation regulatory system decreased wage relativities is, by implication, evidence that increased regulation diminished the potential for on-the-job training. This possibility has important consequences for discussion concerning the desirability of regulation, since decreased skill acquisition -- a consequence of more equalitarian wage structures -- has implications for dynamic efficiency in the labour market. The evidence, as usual, is not unambiguous. Male wage relativities decreased or increased over the period, depending on the occupation considered. We did find consistent evidence that youth/adult wage relativities diminished substantially from 1905 to 1981 and, perhaps more significantly, the rate of increase of wages for teenagers fell substantially between the two time periods. Because there are profound problems in attributing quantitative causality to changed relationships over such a long period of time, we view our results as preliminary. However, close examination of relevant court cases also supports our quantitative work. We conclude that regulation did not necessarily decrease relativities but argue that, if it did, there are significant implications for the nexus between regulation and wage relativities on the one hand, and skill formation and economic progress, on the other.

Flora Gill (University of Sydney), *Determination of Wage Relativities Under the Federal Tribunal 1953-1974*

Australia's system of wage fixing has long been subject to debate. Central to the debate is the question of whether its unique institutional framework generates unique results or whether, alternatively, it is merely a veil for the market forces and the host of social attitudes which affect labour markets in most industrial economies. While agreeing that Australia's folklore has overstated the differences between the wage structure in Australia and that prevailing in either the US or European countries, the paper nevertheless argues that aspects of the structure of wage-relativities remain unique to Australia. The present paper analyzes the historical profile of the wages which are set by the Australian Conciliation and Arbitration Commission. Its empirical results reveal a cyclical pattern in the structure of these relativities which is unique to Australia. The pay gaps across the wage ladder tend to widen in the boom phase of the trade cycle, contrary to the pattern seen in other industrialized countries. This pattern, the paper argues, is an inevitable consequence of the manner in which the Australian institutions of wage fixing incorporated the notion of the 'social minimum-wage' during the period 1907-1967. The system, the paper argues, was primarily guided by an insurance motive, rather than being dominated by either egalitarianism or the rigid preservation of relativities (motives traditionally attributed to the Australian wage fixing system). This conclusion supports Kenneth Arrow's proposition that "... a good part of the preference for redistribution expressed in government taxation and expenditure policies and private charity can be interpreted as a desire for insurance." - K. Arrow, *Essays in the Theory of Risk Bearing*, 1970, p185.

Michael Edelstein (Queens College and The Graduate School, CUNY), *Professional Engineers in the Australian Economy: Some Quantitative Dimensions, 1866-1980*

This essay presents new evidence on the historical development of Australia's professional engineers. Professional engineering is an occupation at the very core of modern processes of accelerating technical change. The new evidence reported here was based on a count of the number and specialization of newly qualified Australian engineers trained in Australian tertiary education institutions from 1866 to 1980. The principal conclusions reached on the basis of this new evidence are: (1) the annual net flow of new, tertiary qualified, Australian professional engineers grew at 5.5% per annum, 1866-1980, well in excess of the growth rate of the population of Australia over the same years; (2) the most significant years of growth were, from the 1920s through the 1950s when the annual net flow of new, tertiary qualified, Australian professional engineers doubled each decade. The decadal growth rate in the 1960s fell back to 50% and then showed a doubling again across the 1970s; (3) the specializations of these tertiary graduates reflected the Australian industrialization which took on significant proportions from the 1920s onward. Civil engineers declined in importance while mechanical, electrical, radio/communications, chemical and, later, electronic engineers increased; (4) perhaps the most important conclusion from these new specialization data is that the surveys which previously guided study of engineering in Australia in the mid-20th century are seriously flawed, relying too heavily on professional societies which did not proportionately represent the Australian engineering population; (5) the net stock of engineers, including foreign trained engineers, nearly doubled each decade, 1939-1969. And the stock per capita, the intensity of engineering use, rose 50% per decade over the same years; (6) clearly, during Australia's leap to modern rates of industrial production and technical change from the 1920s to the 1950s, and its continued high rates of modern economic growth in the 1960s and 1970s, Australia largely import-substituted the production of engineers (7) nevertheless, it was still the case that in the mid-20th century decades, Australia's intensity of engineers use was quite low by international standards.

Noel Butlin (Australian National University), *Human or Inhuman Capital*

Based on several large longitudinal databases, this paper develops and analyses a series of age/earnings profiles and cohort career earnings paths covering in all, some 200,000 Australian graduates, of which 60,000 are economics graduates. Two profiles, in 1971 and 1987, relate economists earnings profiles with those of graduates in other disciplines.

The paper rejects the conventional approach through rates of return. It concentrates on an analysis of the comparative earnings experience of graduates in different industries of employment and explores the changing demand and supply conditions with their consequences for relative earnings experience over careers.

The paper displays the dominance of government in Australia in creating and shaping the careers of economists (and other graduates) and the role of the profession. It also indicates the recent rapid rise of private sector interest. A central thesis is that public demand for macro- and micro-management has (a) severely depleted the quality of the education industry and (b) structured Australian tertiary education to serve the public sector. Since 1971 a significant decline in real earnings, age-for-age, has generated a disaffection (from a conventional rate of return perspective) with the private benefits of education.