IN SEARCH OF ENTREPRENEURSHIP

John A. Murray*

Searching for entrepreneurship has been likened to hunting the Heffalump, that strange and awesome animal of A.A. Milne's imagination (Milne, 1926), hunted by many with varied traps but leading only to conflicting reports of partial sightings (Kilby, 1971). The first reported sighting of the economic Heffalump seems to date from the early eighteenth century and the explorations of an expatriate Irishman — Richard Cantillon — who described the animal as one which bore noninsurable risk. With such an origin to the chase, perhaps it is appropriate that so much energy is now devoted in Ireland to its further pursuit. It is a pursuit driven by the perceived need for more entrepreneurship and for entrepreneurship of a particular kind.

Experience with economic and especially industrial growth since the founding of the State suggests a pressing need for more native enterprise to counterbalance the large foreign investment sector which has been so central to export growth and employment. Such native enterprise must, however, conform to a particular profile. If it is to contribute to long-term economic and social development it must have the potential to grow large in terms of wealth creation and employment. It must therefore be based on large growing markets and high value added products. This demands engagement in relatively new and high technology industries (both manufacturing and service) with international markets.

The search for the Heffalump under such circumstances is in danger of dissipating its energy unless we realise that the demands of the situation require a rather more complex concept of the beast than has been traditional. Ireland needs not just any Heffalump but certain of its rather special manifestations.

The Heffalump is really best conceived of as labelling a genus, which, through evolutionary time and context has developed into several distinct species. With Heffalump Hibernicus we have reached a major

*Dr. Murray lectures in Enterprise Development at University College, Dublin. He wishes to acknowledge the research undertaken by Mr. Frank O'Brien, who is Research Assistant at the Enterprise Centre, University College, Dublin.

evolutionary transition. A radically changed domestic and international environment is selecting in favour of a class of technical entrepreneurship* with which the species has little experience, and whose survival programme is only partially learned. Understanding that programme so as to aid adaptation and assist its emergence is a critical policy concern for the decade ahead.

We embarked upon this paper in order to review, and search for pattern among, *the emirical studies of entrepreneurship in Ireland.* What we found was at first sight disappointing and even confusing. There are relatively few studies, and practically all are exploratory in nature. Moreover, they all observe variants of the Heffalump Hibernicus. To mix metaphors, we have a very few pieces of jig-saw puzzle and even these are weakly defined since few can lay claim to statistical design or representativeness. Reviewed on their own, we believe they offer little help to the policy-maker who wishes to encourage or assist entrepreneurship. We therefore discuss briefly below a broadframework within which entrepreneurship may be conceptualised in order that our particular Irish experience and challenges may be seen in perspective.

The literature on entrepreneurship has two persistent schools of thought. One concentrates on the demand for entrepreneurship and assumes supply will respond smoothly and quicky to basic economic opportunity. This, broadly speaking, is the "economics school". Entrepreneurship for this school is a function of the environmental opportunities available. Increased opportunity results in more entrepreneurship. The policy-maker wishing to promote entrepreneurship should therefore, in so far as possible, increase the incentives and lessen the costs of entrepreneurial behaviour and not worry about much else. The second school of thought concentrates on the supply of entrepreneurship and often comes close to the assertion that it is virtually a binary phenomenon: a community is or is not entrepreneurial by virtue of its psychological, social and cultural structure and dynamics. Many of the strongest statements of this school are dispiriting for the policy-maker since they suggest that the processes producing entrepreneurship are not accessible to policy intervention and may take many generations to "produce" an entrepreneurial group (for example, Hagen suggests a *minimum* "gestation" period of five generations (Hagen, 1962)).

Some of the more constructive recent contributions to the literature seek a synthesis of these two traditional viewpoints. So, for example, Wilkin's study of six industrialised countries suggests the prime importance of economic opportunity in evoking economic growth and associated

*We use this term in a far more general sense than its usual usage in the literature. as will become clear, and apologise for any attendant confusion.

entrepreneurial activity, but finds that the nature of this entrepreneurial activity is significantly determined by non-economic factors. He also draws attention to the very significant role played by the State in determining both the opportunities which generate entrepreneurship and economic growth, and the impact of the non-economic factors which determine the quality (as well as the quantity) of the entrepreneurship (Wilkin, 1979). Kilby argues that the activities required of the entrepreneur are reinforced or impeded by prior techno-economic traditions and social structure factors. So while the economic opportunity conditions prevailing in a society at any time may have a singificant role to play in evoking entrepreneurship, the nature of the supply response will be strongly determined by non-economic factors.

These thoughts yield a concept of entrepreneurship which is both encouraging and cautionary for the policy-maker. The supply of entrepreneurship, it is suggested, responds primarily to economic opportunity. It should therefore be responsive to interventions which improve market information, which improve access to finance, which lessen the tax burden and so on. Equally, however, the nature of the entrepreneurial activity which emerges in response to such factors will be conditioned by past and present socio-techno-cultural factors. Thus, under Irish circumstances economic incentives and market information such as now provided by a variety of state and semi-state agencies should provide an attractive incentive for entrepreneurial activity to increase. The tendency for supply to increase will however be mediated by non-economic factors. Since our need is most urgent for technical entrepreneurs one might hypothesise that the non-economic factors are now playing a significant and predominantly restraining role. Our commercial traditions have little to do with technological innovation, with the organisation of large professionally managed businesses or with international operations — all necessities for future growth. The supply of knowledge, skills and experience in these areas is very limited. Moreover, with an entire culture no more than one generation removed from a very traditional, conservative rural family system, even the basic values and behaviours associated with industrial entrepreneurship are barely rooted.

Can this set of mediating factors be affected by policy action? Before trying to answer that question we should look at what is known about both the supply and demand side of Irish entrepreneurship.

IRISH ENTREPRENEURSHIP

Th existing empirical studies are basically exploratory research efforts and concentrate on entrepreneurs rather than entrepreneurship. There is not much commonality between them so that comparisons are difficult and because they are not based on statistical sampling, representativeness

cannot be claimed. However, some common measures have been made and we shall concentrate on these. The studies reviewed are restricted to entrepreneurs starting manufacturing ventures.

The age of those starting new ventures as represented by these studies (Rothery, 1977; Ahmed, 1977) covers the span from late twenties to late forties. This seems consistent with the need for entrepreneurs to gain experience in a particular field before starting on their own, and conforms to international findings concerning the age of entrepreneurs at the time of venture creation (mean age usually in mid-thirties — Cooper, 1970; Litvak and Maule, 1974). Father's occupation varies considerably, although in the earlier and more general studies farmer is a very likely position (Rothery, 1977; Fogarty, 1973) while the more recent study of entrepreneurs in the plastics industry shows a predominance of professional fathers (Ahmed, 1977) similar to the profile of innovative managers' fathers in Barron and Egan's work (Barron and Egan, 1968). All studies show a strong representation of 'merchant class' fathers, mostly retailers. These findings are hardly surprising. A commercial family background would logically seem to train the entrepreneur from an early age in commercial practice and values. The high incidence of farmers' sons could be attributable partly to the existence of a commercial farming background, or perhaps more strongly to the preponderance of the rural population in Irish demographics until very recent times.

All studies find a high incidence of entrepreneurs attending school for a longer period than was the norm for their age group, and a high level of participation in specialised vocational training. Once again, these findings vary in detail between the earlier general studies which find entrepreneurs acquiring trades, while Ahmed's entrepreneurs predominantly hold third level educational or technical qualifications (Ahmed, 1977). Already we begin to see that two types of Irish entrepreneur have been observed which might be roughly classed as the technical and non-technical variety.

It is normally hypothesised that the entrepreneur sets-up business in the field in which he has accumulated work experience as well as technical expertise. This seems to be borne out by all studies. A specialised skill, trade or technological expertise is associated with working on its application and the subsequent founding of a venture based on that skill and related experience. Moreover, the entrepreneurs observed typically associated themselves with the best managers or craftsmen in order to learn as quickly and deeply as possible their employer's business, in preparation (conscious or otherwise) for their own start-up. While it is not explicitly addressed in most studies, Fogarty's work (Fogarty, 1973), and the implicit evidence of most others, suggest that entrepreneurs possessed a particular ability in terms of encouraging creativity among

their subordinates and in bringing out their best performance. A special skill in organisation building and motivation therefore seems likely.

Turning from personal characteristics to the process of enterprise formation, the existing evidence shows that financing the start-up was seen by all as their major initial problem. In almost all cases studied, initial capital came from the entrepreneur's private sources — savings, sale of property, from relatives or friends. The majority of entrepreneurs studied did obtain outside finance at a later stage, suggesting that the semi-state and banking sectors have traditionally become involved with new ventures only after an initial track-record had been established. Partnership is frequently recorded as a means of securing needed initial capital but there is no available evidence as to the success or otherwise of such arrangements. International studies have drawn attention to partnerships as a common cause of difficulty for new enterprises during their early growth period (e.g. Collins and Moore, 1970). Finding a place to start the new business is also a barrier recorded in the research, either at the initial launch stage or as soon as the venture grows beyond "back yard" scale. This has led to the suggestion that an urgent need exists for a rental purchase scheme for premises (Lucey, 1979). Complaints about difficulties encountered in starting-up (Rothery, 1977; Fogarty, 1973; Ahmed, 1977) centre on time required to learn how to deal with government and semi-state agencies and telecommunications problems.

The research surveyed above is complemented by a series of case studies undertaken by students of enterprise development at University College Dublin over the past three years. These small scale student projects involve writing a case-history and analysis of an entrepreneurial venture and encompass ventures in manufacturing and services; high and low technology; new and traditional sectors. In so far as it is possible to generalise from an unrepresentative and very heterogeneous set of cases, some pattern does seem visible.

A high proportion of the entrepreneurs had fathers in business. The most common triggering factor for entry into entrepreneurship was conflict with an employer but many simply responded to their perception of an opportunity, and moved to grasp it. Almost all worked in the business area in which they subsequently created their own enterprise and drew their new venture concept from this experience. Partnership is a common pattern among these cases but with considerable variation in the degree of active involvement by the partner or partners. To the extent that these ventures have grown successfully, such growth is most commonly based on expansion into related products and markets.

The available evidence therefore suggests a profile of the Irish entrepreneur at the time of starting a new venture as experienced; educated beyond the norm for his age group, although with a very

practical and utilitarian approach to education; likely to come from a family background with commercial or business involvement; equipped with considerable experience of working intensely in the area in which the new venture is created and taking from that experience the knowledge and practices of the best role models whether managers, foremen or craftspersons. The process of starting their new enterprise is marked by difficulty in raising *initial* finance, and frequently in finding premises, while telecommunications and the investment of time required to learn how to deal with public agencies and banks remains a frustration.

The general literature on underlying socio-cultural variables which influence the emergence and the quantity of entrepreneurship in a society stresses severe central variables.* Legitimacy is conferred on the entrepreneurial role by the sociocultural features of the society, giving the role a particular status and creating attitudes towards it, and expectations about its performance. In Ireland, one might suspect at very best a modest legitimacy for entrepreneurial behaviour, given the values of the traditional farm family system to which we are still culturally so close (Arensberg and Kimball, 1968) and the effect of our schooling system with its strong and persistent emphasis on training for the professions and the liberal arts. Social mobility is seen by writers as acting in two ways. A society in which access to social mobility is high is seen as encouraging entrepreneurship which becomes a vehicle of upward mobility (McClelland, 1961) while relative social blockage for a particular group is also seen as the source of a long-term social process producing an entrepreneurially active sub-group in a society (Hagen, 1968). In so far as we know about them, Irish entrepreneurs do not appear to come from any relatively blocked sub-group unless one were to hypothesise that the native Irish represent a relatively blocked group compared with the Anglo-Irish ascendancy until well after independence. Certainly in the modern period, social mobility and entrepreneurial success would seem to be frequently associated factors. (see Ahmed, 1977).

Social marginality for any group in a community is also hypothesised as a determinant of entrepreneurial activity. Thus the combination of low access to social mobility and low legitimacy may lead to the emergence of what Wilken calls "outside entrepreneurship" (Wilkin, 1979). However, where both access to mobility and legitimacy are high Wilken suggests the occurrence of "mainstream entrepreneurship" where the entrepreneur emerges from the mainstream of society rather than fighting his way against its current. Irish circumstances would seem to conform to a rather mild form of mainstream entrepreneurship.

*Legitimacy, Access to mobility channels, Marginality, Social integration, Security, Ideology, Motivation.

Ideology is another variable in the Irish context which may have both positive and negative influences on entrepreneurship. While the Protestant ethnic is far from rampant in Irish society, a nationalistic ideology may have played an important role in the early success of many state and semi-state ventures and it is a feature of the self-analysis of many entrepreneurs reported in the available research (e.g. Fogarty, 1973). The drive to build a prosperous and independent society and to prove its viability when separated from the colonial system is a potentially powerful force, although one likely to decline with the passage of years. The recorded comments of many entrepreneurs also return repeatedly to stressing hard work, honest dealing and the pursuit of universial rather than parochial standards of excellence.

The ideological impact of a predominantly Catholic population may militate against entrepreneurship in contrast with the influence of Weber's Protestant Ethic and research elsewhere seems to provide support for this hypothesis (Litvak and Maule, 1974). The debate on entrepreneurial motivation owes much to McClelland's work on the need for achievement. While we have little Irish evidence to marshall on this issue, a reading of the various studies of Irish entrepreneurs suggests a high need for achievement in most cases. However, specific research is needed to advance beyond such a tentative suggestion.

On the supply side, Irish entrepreneurship would seem to find itself in a delicate but evolving balance of structural barriers against, and supports for its emergence. If one considers the specific need for technical entrepreneurship — defined as combining technology-based skills and experience with professional managerial competence — then perhaps the barriers remain greater than the supports, at least for the moment. The research we have reviewed reflects international findings in highlighting the tremendous importance of having well-learned skills and first-hand experience related to the area of venture creation. The absence of any significant tradition of producing high value-added products and services in organisations which can reap the full benefits of professional management and scale and experience effects, and of trading these outputs on international markets, is unquestionably a most serious blockage.

Foreign enterprise can only help as a mechanism for breaking this barrier if it embodies products and processes using advanced technology and if native employees can work with that technology and on the associated marketing, organising and financing decisions. Under such circumstances it would be reasonable to expect these foreign companies to act as "incubator organisations" spinning-off service, complementary and competing new ventures. Of course such foreign companies, if they were to transfer significant managerial and production activities to

Ireland would require a supply of personnel with high standards of basic training in the technical and managerial areas, so the chain must reach back to the educational infrastructure. Policy intervention would therefore seem appropriate at three levels:

(a) support of the education and training infrastructure in the relevant areas of technology and management; (b) adjustment of the incentives to foreign enterprise to remove the tax disincentive to transfer managerial and research and development activity to Ireland; (c) support for spin-off native enterprise and for other native enterprise that produce high value-added products and services for international markets and have the potential to grow to sufficient size to reap the benefits of access to those markets.

THE ENVIRONMENT FOR ENTREPRENEURSHIP

If the opportunity afforded by the economic environment is the principal cause of entrepreneurial activity, albeit mediated by technical-social-cultural traditions and forces, then it is important to examine the environmental setting of Irish entrepreneurship. It is important to stress this point as one frequently encounters the opinion that the successful entrepreneur succeeds despite the environment or independent of the degree of threat or support which it embodies. The available international evidence and simple economic logic, contradict this viewpoint very unambiguously. Equally, the evidence suggests that the State can have a significant impact on entrepreneurial activity by manipulating the economic environment either to its advantage or disadvantage (Wilkin, 1979).

Ideally, one would like to correlate the level of entrepreneurial activity with the movement of important environmental variables. Entrepreneurial activity is difficult to measure, however. There are no statistical series aimed at measuring the number and kind of new ventures created each year. Independent small firms are indistinguishable from subsidiaries of large enterprises, for example, in the available published data. Nonetheless some rather crude figures are available on:

(1). number of small manufacturing firms (employing less than 100) and

(2). numbers of industrial projects approved by state development agencies.

Table 1 shows that while the sixties saw a marginal decline in numbers of small manufacturing firms, the seventies witnessed a considerable increase. Table 2 shows that a very major part of this increase came from firms employing less than 10 persons, almost all of which are certainly domestic entrepreneurial ventures.

Table 1: Number of Small Firms in Manufacturing Industry 1958-1980		
Year	No. of Firms employing less than 100 persons	% Change
1958	2,802	—
1963	2,702	— 4%
1968	2,658	— 2%
1980	4,051	+52%
(Source: CII, The Small Firms Association, *The Small Firm in Ireland, 1980)*		

Table 2: Growth in Number of Firms in Manufacturing Industry by Employment			
No. Employed	1968	1980	% Change
3—9	928	1,595	+72
10—49	1,437	1,965	+37
50—99	361	491	+36
100+	428	577	+35
	3,154	4,628	+50
(Source: CII, The Small Firms Association, *The Small Firm in Ireland, 1980)*			

These tables pose interesting questions. Why after a period of slight decline did the numbers of small businesses increase so dramatically during the seventies? Why is this growth so concentrated among those employing less than 10 persons? Will the relatively large number of such new, but small, enterprises grow into ventures of substantial employment potential or are they in a small business "trap" of inherently limited size and growth potential?

Table 3 is an indicator of state involvement in creating a supportive environment. Project approvals quickly plateaued after 1968 and then experienced a dramatic upturn from 1977 onward. So we observe two policy interventions which might be considered in parallel with the figures on numbers of small businesses: first, the creation of the small industries programme of IDA and second, its substantial expansion since 1977. Table 3 figures on job approvals per project show a shift from 1973-4 onward to a higher average number of jobs per project approved, although overall, the employment size of approved projects remains very small. Whether this represents a shift toward larger entrepreneurial projects or toward more labour intensive ones is an interesting question. The average value of grants per project shown in Table 3 suggests perhaps a shift to slightly larger projects although if the grant figures are deflated, one observes a more modest increase in real grant levels. The relationship between job approval figures and jobs created is another confounding factor.

Table 3: Small Industry Project Approvals 1967–1980

Year	No. Projects	Average No. Jobs Approved per Project	Average Grant per Approved Project
1967–68	46	8.4	£ 1,937
1968–69	139	5.9	£ 6.614
1969–70	209	5.2	£ 8.129
1970–71	187	5.7	£ 6,027
1971–72	140	8.5	£ 6.644
1972–73	138	9.5	£ 8,424
1973–74	127	15.5	£14,290
1974 (nine months)	153	13.9	£14,163
1975	128	14.1	£16,521
1976	196	15.0	£24,785
1977	278	13.9	£22,960
1978*	430*	14.1	£29,360
1979*	618*	13.5	£40,090

*1978 and 1979 figures are for IDA only. All others include IDA, SFADCO and Gaeltarra Eireann.
(Source: IDA, Small Industries Report)

Table 4 shows a sectoral breakdown of the small firm statistics. Unfortunately the breakdown is rather crude, preventing a detailed analysis of the growth in engineering, for example, which might tell us whether expansion came in the more advanced technology subsectors of engineering or not. Given international market conditions, the growth in textiles, clothing and footwear, and wood and furniture are not exciting developments for the long-term, although they may represent productive import-substitution activity in the short-term and some highly differentiated product success in export markets. In this context, it is worthwhile to reflect on our earlier comments about restraints on the supply of technical entrepreneurs. A supportive environment may be successfully evoking "traditional" entrepreneurship (i.e. non-technical and based on experience in traditional sectors, and production methods and domestic markets), while facing structural supply barriers in drawing out technical entrepreneurship which is the source of long-term growth and competitiveness internationally. Returning to the figures on engineering sector growth, for example, Kieran's study does not paint a picture of very innovative enterprise (Kieran, 1975). He found commitment to product development and exporting low despite awareness of market opportunity and a far from aggressive pursuit of research and development or technology transfer possibilities.

The history of the period 1960–1980 shows from the late sixties, a consistent pattern of state intervention to support entrepreneurial activity. Although the precise date of some policy interventions and their built-up cannot be pinpointed, Figure 1 plots the presence of most of the

Table 4: Sectoral Distribution of Small Firms 1968–1979

Sector	No. Firms Employing 3–99 Persons 1968	1979	% Change
Food, Drink & Tobacco	907	766	— 16
Textiles	155	174	+ 12
Clothing & Footwear	280	337	+ 20
Wood & Furniture	293	532	+ 82
Paper & Printing	233	352	+ 51
Chemicals	126	144	+ 14
Structural Clay, Glass & Cement	116	284	+145
Engineering	338	949	+181
Miscellaneous Manufacturing	210	407	+ 94
Total	2,658	3,970	+ 49

(Source: CII, Small Firms Association, *The Small Firm in Ireland, 1980)*

major supportive actions which affected the entrepreneurial environment. Most of these have concentrated on improving the availability of, and access to, finance, although more recent activity is characterised by a clear concern to provide services that improve the level of technology applied and the expertise of the management used. Such a shift from a policy of primarily freeing access to finance to one of attacking the supply barriers of technical and managerial expertise is precisely what is needed although the latter processes of intervention are slower moving and more complex to implement than the financial one.

The Enterprise Development Programme of the IDA is an interesting reflection of this policy shift. It attempts to focus on entrepreneurs, or entrepreneurial teams, that embody both a high technology background and professional managerial expertise. Thus, basic resources for creating a technology based venture with potential for substantial organisational growth should be present at the outset. A problem which must be faced by this programme however, is the supply of such persons or teams. And this returns our discussion once again to the need for a set of "incubator" companies in the country which will spin-off such potential entrepreneurs and for the technological and managerial education infrastructure which must supply the incubators and service both them and the "spin-off" new ventures.

Apart from the conscious innovations of the state and banking sectors during 1960–1980, the environment for entrepreneurship reflected several inhibiting features. Two periods of quite severe economic recession, one in the mid-seventies and one at the start of the new decade dampened general domestic and international demand and the opportunity for many potential new ventures. Increasing inflation levels could be a significant restraint also with their incentive to invest in property, for

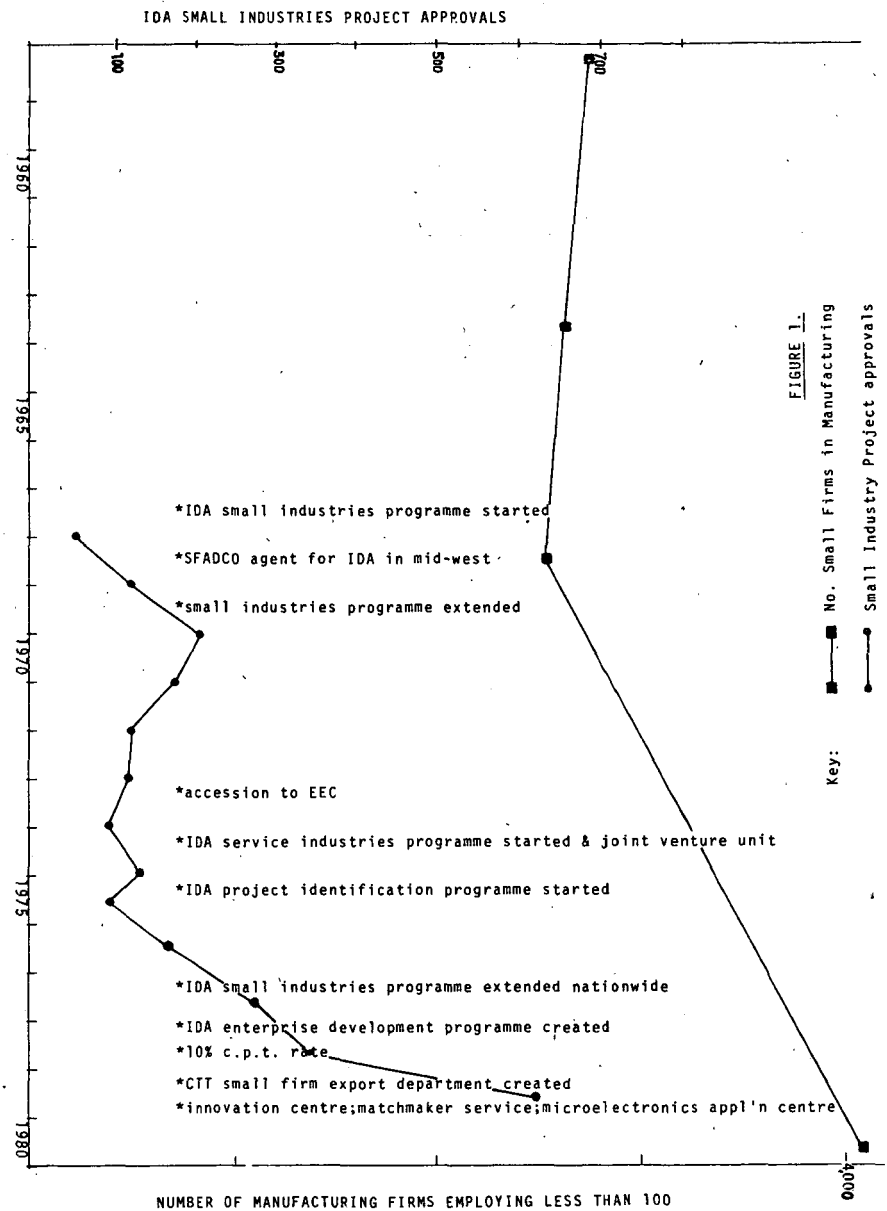
IDA SMALL INDUSTRIES PROJECT APPROVALS
100
300
500
700
1960
1965
1970
1975
1980
*IDA small industries programme started
*SFADCO agent for IDA in mid-west
*small industries programme extended
*accession to EEC
*IDA service industries programme started & joint venture unit
*IDA project identification programme started
*IDA small industries programme extended nationwide
*IDA enterprise development programme created
*10% c.p.t. rate
*CTT small firm export department created
*innovation centre;matchmaker service;microelectronics appl'n centre
Key:
No. Small Firms in Manufacturing
Small Industry Project approvals
1000
NUMBER OF MANUFACTURING FIRMS EMPLOYING LESS THAN 100

FIGURE 1.

example, rather than manufacturing enterprise. Also, while the overall tax climate is favourable, attention has been drawn to the absence of any special tax arrangements in support of innovation by small firms (E.A.G., 1979) such as in most other E.E.C. countries. The generally low level of R.&D. activity in Ireland has been frequently reported, and while development rather than research may be more appropriate to our needs, the continuing low involvement creates a poor supportive environment for the generation of innovations and new venture concepts for high value-added products (E.A.G., 1979; Jackson, 1977; Allen, 1979: NBST, 1981).

CONCLUSIONS

We have tried to survey the habitat and behaviour of Heffalump Hibernicus in the paragraphs above. Available evidence allows us only to make general suggestions concerning the linkage between the two and indeed the character and behaviour of the beast remains only dimly perceived. With regard to the nature of the elusive Heffalump we have suggested that our quarry is in fact a genus represented by several related species and that its evolutionary history is now characterised by the emergence of a new variant: technical entrepreneurship. While parts of the environment favour its emergence other parts of the habitat militate against its rapid multiplication. These latter structural features deserve the policy makers greatest attention. For the researcher wishing to contribute to policy making we would urge the use of a more complex concept of entrepreneurship than has been traditional: one that acknowledges significant differences between technical and non-technical entrepreneurship; between organisation-building entrepreneurship and that of the "one-man-show" type; between family and professional entrepreneurship. We would also urge-on any attempt to probe the casual influence (as opposed to the definitional significance) of entrepreneurship in Irish economic development and the functional relationship between environmental opportunity and the level of entrepreneurial activity.

Some general concluding comments seem appropriate and even important to make. None of them can be held to have been "proved". They are offered as judgements based on available evidence — no more and no less:—

1. Past discussion of entrepreneurship has too often been mistaken in assuming a single phenomenon: the existence of the unique Heffalump. Instead, there are many variants, and the one of greatest importance to continuing Irish development is technical entrepreneurship. We use the word entrepreneurship rather than entrepreneur deliberately as this, and most other forms of complex entrepreneurship, are probably best understood as organisational phenomena, rather than as the behaviour of

one individual (a point also made by Aitken, 1963). An entire organisational process, its origins, structure, dynamics and consequences should be the prime focus of interest.

2. The climate of entrepreneurial opportunity has been substantially improved in Ireland through a variety of policy interventions, especially over the past ten years. This should have a significant continuing impact on the level of entrepreneurship in the country.

3. No matter how attractive the opportunity for technical entrepreneurship is made through economic incentives, we suggest that there are significant barriers to entry based in the socio-technical environment.

Technical entrepreneurship, by definition, requires an available pool of technological expertise and empirical evidence suggests that this is acquired through education and the work experience of the entrepreneur. Without a significant core of firms already involved in high technology business, how can the required experience be acquired? It can be brought into the country by attracting enterprise from other countries to set-up businesses here based on the required technology while tying incentives specifically to conditions concerning the training of employees in order to create "incubator companies" which spin-off technical entrepreneurs. Because of the magnitude of the gap in our technical innovation tradition however, these firms may have to be encouraged at several points in the chain of production. It may therefore be necessary not just to import the final stage technology but also the technology involved in servicing and supplying final producers. Some considerable critical mass of technology application and innovation is necessary to generate appreciable numbers of native entrepreneurs through its impact on the related infrastructure (R.&D.; Universities; financiers etc.) and through the sheer number of persons employed in positions requiring mastery of advanced technology.

Barriers to entry into independent entrepreneurship are not confined to the problem of technology acquisition or transfer. There are other significant barriers dampening the response to attractive economic incentives. Principal among these are:

(a) short supply of the required managerial technologies of organisation building and direction, a shortage compounded by the necessity to have entrepreneurs or entrepreneurial teams that are *both* technically *and* managerially expert.

(b) short supply of both information and experience in dealing with international marketing . . . an "ignorance factor" which is very competently attacked by the Irish Export Board (CTT) through its

information provision services but which is often compounded by an apparent unwillingness of Irish firms to go abroad and learn at first-hand the requirements for doing business in international markets.

Can the policy-maker take heart from these judgements? We think yes. There are available points for intervention in the entrepreneurial system in the country. However, the means of intervention will have to be adapted to a more complex notion of entreprenurship, its origins and dynamics.

REFERENCES

Ahmed, M., "An Analysis of Small Scale Entrepreneurs in the Irish Plastics Industry", *Economic & Social Review, Vol. 8, 4, July 1977.*

Aitken, H.G.J., "The Future of Entrepreneurial Research", *Explorations in Economic History, (Fall, 1963).*

Allen, T., *"Transferring Technology to the Firm". IBAR, Vol. 2, 1, 1979.*

Arensberg, C.M., & Kimball, S.T., *Family & Community in Ireland,* (Harvard Univ. Press, 1968).

Barron, F. Egan, D., "Leaders & Innovators in Irish Management: A Psychological Study". (IMI, Working Paper, 1969).

Collins, O.F., & Moore, D.G., *The Organisation Makers: A Behavioural Study of Independent Entrepreneurs.* (N.Y. Appleton, 1970).

Cooper, A.C., "The Palo Alto Experience" *Industrial Research,* (May, 1970) 58–60.

Economists Advisory Group, *Government Barriers to Innovation by Small Firms in Ireland.* Report to the European Commission, London, 1979.

Fogarty, M.P., *Irish Entrepreneurs Speak for Themselves.* ESRI Broadsheet No. 8 (Dublin, ESRI, 1973).

Hagen, E.E., *On The Theory of Social Change: How Economic Growth Begins.* (homewood, Ill, Dorsey, 1968).

Kieran, J., *Technology Transfer,* (Dublin Stationery Office, 1975).

Jackson, P., "New Product Development in Small Firms" Unpublished M.B.S. dissertation, Faculty of Commerce, UCD, 1977.

Kilby, P., *Entrepreneurship & Economic Development.* (N.Y. Free Press, 1971).

Litvak, I.A., & Maule, C.F., *"Profiles of Technical Entrepreneurs".* Business Quarterly, 39, (1974).

Lucey, J., "A Study of Factors Influencing Survival and Growth of New Enterprises". Unpublished M.B.A. dissertation, Faculty of Commerce, UCD, 1979.

McClelland, D.C., *The Achieving Society,* (N.Y. Free Press, 1961).

Milne, A.A., *Winnie-the-Pooh,* (London, 1926).

N.B.S.T. *Science & Technology in Industrial Development* (Dublin, NBST, 1981).

Rothery, B., *Men of Enterprise,* (Dublin, IIRS, 1977).

Wilkin, P.H., *Entrepreneurship – A Comparative & Historical Study.* (New Jersey, Ablex, 1979).