
VERN BULLOUGH
BONNIE BULLOUGH
MADDALENA MAURO

History and Creativity: Research Problems and Some Possible Solutions

Historically, creativity has been a difficult subject to research. Since we have been doing exactly that for over a decade, this article is an attempt to examine some of the difficulties that are involved, to indicate our working solutions, to give some of our answers and, in the process, to raise questions about some past findings in the area (Gowan & Olson, 1979).

Part of the problem in studying historical creativity lies in arriving at accurate definitions since creativity has been defined in different ways at different times. Adolphe Quetelet, a nineteenth-century Belgian, believed and taught that the moral nature of men and the qualities of a group of men could best be determined by a statistical study of their actions. It was these assumptions which laid the foundation both for the studies of achievement and for the IQ test.

The most significant of the early researchers was Sir Francis Galton who, using Quetelet's assumptions, attempted to isolate and describe individuals with great natural endowment. Galton's purpose, however, was not so much that of isolating and describing individuals with great natural mental endowment in the past, but rather that of encouraging the birth of more such individuals (Galton, 1870). His second objective was more important to him than the first, and led to the development of the field of Eugenics, an area of studies that today is not particularly fashionable because of the rather blatant racial and ethnic connotations associated with it in the 1920s and 1930s. In part, it was also discredited because of the poor research methodologies of some of its adherents.

Some of this poor methodology can be traced to Galton's use of the term genius, also used by Cox (1926). What constitutes genius? How can it be measured in historical terms? Is it

a valid concept? Recent research on contemporary achievers suggests that while there is some correlation between intelligence and creativity, the relationship disappears above an IQ of about 120 (Barron, 1957; Drevdahl, 1956; Eisenman & Robinson, 1967; Guilford, 1967; Hudson, 1966; McNemar, 1964; Roe, 1952; Wallach & Kogan, 1965; Wallach & Wing, 1969; Yamamoto, 1965). Genius, however, meant something different to Galton than it came to mean to those who developed IQ tests. In a historical sense genius, as the term is now used, has no meaning. This is because no historical study can measure natural mental endowment; rather it can measure only significant intellectual and creative contributions which may or may not be the same thing. To avoid the confusion engendered by the term genius, as well as the emotional connotation, we prefer the terms intellectual and creative achievers. This is essentially all we can measure. These terms also have the advantage of indicating that achievement is being measured instead of actualized genius, a term used by some, which tends to perpetuate some of the misconceptions about what kind of people achieve.

Achievements, however, have to be clearly defined since the mass murderer might well be a creative achiever and so might the mother who gives birth to 14 children. While these examples perhaps might be easily dismissed, it is not so easy to distinguish achievement from what could be called success. Successful business, religious, political and military leaders are achievers, and obviously often have to have intelligence and creativity to arrive at the positions that they have. By design such individuals have been excluded from the study reported here unless they had significant intellectual and creative achievements in addition to their administrative or managerial roles. For example, a general, who wrote significantly on military tactics, would be included, but one who was simply an effective commander was not. One reason for exclusion was simply to keep the list of achievers manageable. A second reason, however, was more objective. Preliminary research had indicated that many, if not most, of the significant members in what might be called the "successful" administrative and management groups in the periods before 1800 came from the upper classes, and their high position was not so much an individual achievement but a family one. Since family and social ties tended to carry more weight in these kinds of administrative and managerial positions than did individual ability, it seemed justifiable to exclude these areas from the study.

Definition of achievement, however, is only the first step. A second major problem is identifying a suitable sample for study. Researching all those who have been significant creative and intellectual achievers in history is impossible even if time and resources are unlimited; historical data in many periods is far too meager to get any kind of personal or societal data. Cox (1926) had dealt with the problem by limiting her study to 301 individuals from 16 nations over four centuries. Though her study might be indicative of the backgrounds of 301 individual achievers, it is not necessarily an indicator of the backgrounds of those significant intellectual and creative achievers who were not included in her study. Moreover by isolating individuals, many factors are ignored, such as interaction with a group which might or might not be important.

Kroeber (1944) developed a sample of over 5,000 creative individuals in different categories in the periods from 700 B.C. to 1900 A.D. Several criticisms of his list are evident. First, the list is by no means exhaustive and, though there can be no debate about the better known individuals on his list, there is room for great debate over why some of the lesser known individuals were included and others were not; there were also variations between different periods and between different language and cultural groups. Kroeber, however, was not concerned with the individual achievers but instead, as he himself stated, used his individuals as indices, not agents of periods of greater or lesser creativity. He took as his task the tracing of patterns of creativity in all civilizations, trying to portray configurations in time, in space and in degree of achievement (Gray, 1966).

What Kroeber did from an anthropological point of view, Pitrim Sorokin (1937-41) attempted to do in historical sociology. The same criticism can be leveled against Sorokin as against Kroeber, but Sorokin also was not concerned with the creative or achieving individual per se. Moreover, Sorokin (1950) agreed with Kroeber on the clustering of geniuses. Since Kroeber and Sorokin wrote, numerous others have added to the type of studies that they were doing (Sorokin, 1957) and attempted to refine their methods or suggest changes (Gray, 1958, 1961, 1966; Naroll et al., 1971; Arieti, 1976; Simonton, 1974, 1975b; Simonton, 1976a, 1976b, 1976c, 1976d, 1978). Most studies, however, rely upon Kroeber's own selection of individuals, and though the computer has allowed us to give more sophisticated analysis of his data, it is still the same data that is being analyzed. This implies that the same assumptions are perpetuated but in ever more sophisticated form.

Recognizing the limitation of the sampling procedures of others is comparatively easy; developing procedures to overcome these difficulties is far more difficult. One way of dealing with the problem, and one we ultimately adopted, was to do an intense study of intellectual and creative achievers in one time period, trying to acquire as near a total sample of achievers as possible. To do such a study required several things. First, the period to be studied had to be one which others had recognized as a creative one, since we did not want to do studies on time periods or areas chosen for apparently arbitrary reasons. Secondly, to meet our standards for historical investigation, the period had to be one in which there were sufficient source materials to do a comprehensive study. Periclean Athens, for example, is often cited as a Golden Age but the source material is insufficient to do the kind of quantifiable studies so necessary to evaluate the societal and individual factors that might be important for achievement. At the same time the period had to be far enough removed from our own time that we could have some standards of agreement about who was or who was not an intellectual and creative achiever. Thirdly, the period and area chosen also had to be one where the investigators could read the source material — which primarily meant a European language area. Fourthly, and most important, the area and time period chosen had to be one in which the total number of achievers was manageable and not beyond the limits of individual investigators since funding sources were limited.

After considerable study we selected eighteenth-century Scotland as our initial society to study. There were ample sources for individual biographies, there was enough existing population data to allow us to do effective statistical analysis and, most importantly, the eighteenth century was recognized as a kind of golden age for Scotland, the period of Adam Smith, David Hume, James Watt, Sir Walter Scott (who continued into the nineteenth century), James Mill, James Boswell and many others.

As a second period we selected fifteenth-century Italy, conscious that the source problems here were extremely difficult and that many of the variables we would be interested in would not have sufficient data to examine them. We believed that if the method worked for eighteenth-century Scotland, we could apply it to fifteenth-century Italy, hoping to replicate some of the findings. We realized that to go into any earlier period than fifteenth-century Italy for our kind of study was almost impossible. To go any later than the eighteenth century was also

beyond the limits of the abilities of the authors because of the plethora of sources. Other areas deserving of study, such as seventeenth-century Holland, posed linguistic difficulties for us. Both France and England seemed too large an area. Hopefully, however, we plan to do later studies on subgroups of achievers in the nineteenth and early twentieth centuries: i.e., the German Jews of the nineteenth century, the Utah Mormons of the twentieth, and so forth. So far, however, we have examined two significant groups of achievers: those in Scotland which have been analyzed in great detail, and those in Italy, where the analysis has to be, by the nature of the sources, far more limited.

Since we wanted to include as large a sample as possible, we started the Scottish study by trying to include everyone who was regarded as a significant intellectual or creative achiever in eighteenth-century Scotland. For our purposes these were people born between 1685 and 1785. We soon found that standard biographical collections used by so many others in attempting to determine achievement were inadequate. Though the majority of our figures were in the *Dictionary of National Biography (DNB)*, a significant minority were not. The reasons why some were included in the *DNB* and others were not are not always clear, although several of those excluded from the *Dictionary of National Biography* ended up in the *Dictionary of American Biography*, apparently because they moved to the United States at a later date and achieved most of their fame here.

Some of those excluded from the *Dictionary of National Biography* were in fields and areas where recent research had led to a re-evaluation of their accomplishments. Still others seemed to be peculiarly Scottish figures, perhaps with a regional rather than a national reputation, and perhaps for this reason had been excluded from the *DNB*. On the other hand the *DNB* included many eighteenth-century Scottish military, political, business and religious leaders who did not figure in our studies. To supplement the list from the *DNB* we read widely in eighteenth-century Scottish studies, examined specialized histories of the eighteenth century dealing with subjects such as art, philosophy, music, theology, literature, and compiled our names. We ended up with 385 individuals born in Scotland who achieved some degree of intellectual or creative eminence. We then proceeded to do biographical studies on these individuals in the United States, England and Scotland. Since we were interested not only in why these individuals achieved, but why other Scots might not have, we also did

studies of those parishes (the base unit in Scotland at that time) where our achievers came from and compared what we called the contributing parishes with the noncontributing parishes. The results of these studies have been published in various journals (see bibliography).

As the Scottish studies neared completion, we began exploration of fifteenth-century Italy. Unfortunately there was no similar compilation equivalent to the *DNB* for all of Italy, and so we had to begin with independent listings of humanists, scientists, artists, poets and so forth. We also read widely in fifteenth-century Italian literature, and examined the same kind of specialized histories dealing with fifteenth-century Italy or regions of Italy. Ultimately we gathered together the names of over 1,100 individuals whom we regarded as important intellectual and creative achievers, far too many to do the kind of biographical studies we wanted to do. Instead of doing the whole Italian sample, we narrowed it down to those born in the areas controlled by fifteenth-century Florence. The same kind of date limitations (1385-1485) were imposed, and data collection began. Ultimately we ended up with 290 names. In spite of our efforts, however, which included active research in Italy for one of our team, a significant number of the Italian biographies remained too incomplete to do the kind of analysis we did for Scotland. On only 158 individuals was their sufficient data to do detailed analysis. As a group these 158 were more significant achievers than their Scottish counterparts. (This indicated to us that the farther back in history that we go the more we lose sight of the less significant intellectual and creative achievers; this in itself biases any historical study of achievement such as Kroeber's because more modern, less significant achievers are included.) Information on towns and regions of origins of the achievers was even less complete for Florence than the biographical data and we were therefore unable to do the kind of detailed analysis that we did for Scotland. Still some significant variables have appeared, and many of the findings in the Scottish studies appear to be replicated in the Italian studies.

One of the most important variables, as far as individuals were concerned, is class status. In spite of the different time periods involved in the study, the significant intellectual and creative achievers tended to come from the well-to-do middle classes but not the aristocracy. In retrospect the reasons for this seem obvious. The definition of intellectual and creative achievement in western culture has been essentially a middle class one, at least for the past few centuries. It is this class

which purchases the books, buys the paintings and controls the institutions which in our society and in past societies determined who was or was not an intellectual or creative achiever. If our studies have any validity they tend to demonstrate that it is extremely difficult for a person born into a culture of poverty to become a significant intellectual or creative achiever. Instead the process of achievement as we have been able to trace it for those who came from poor backgrounds seemed to be a multigenerational one, usually three generations. The grandfather of the achiever moved out of actual poverty into a low level intellectually-oriented occupation, such as clerk, or teacher; the father moved into the professions or business; the son, born into a striving middle class family, became the significant intellectual or creative achiever. Son is the correct term to use since there were comparatively few women achievers in our samples, and all of those came from families of advanced social and economic standing. The Scottish aristocracy, however, produced fewer achievers, perhaps because they did not espouse the achievement ideology. Florentine aristocratic families differed in this respect — some 30 per cent of the achievers were born into such families. The Florentine aristocratic families were more urban centered than the Scottish ones — more attuned to middle class ideology.

TABLE 1 Age at death of eminent Scottish achievers.
 (n=375)

Age Range	No.	Percentage
Unknown or Uncertain	10	3
Under 30	3	1
30-39	8	2
40-49	29	8
50-59	46	12
60-69	93	25
70-79	107	28
80-89	69	19
90-99	9	3
Over 100	1	
(percentages rounded off)		101%

Another finding was that significant intellectual or creative achievement was rarely carried on in the same family beyond one generation. There were several siblings in our studies, one three-generational family of achievers, and several two-generational ones. Contrary to the assumptions of Galton, however, significant intellectual and creative achievers did not usually have children who also achieved. Apparently then, there is also more to achievement than genetic inheritance. In our three-generational family, the Munros of Edinburgh medical and scientific fame, the third generation achiever might not have been so significant if his father and grandfather had not been so respected: their own position made it possible for him to achieve the position and intellectual reputation that he did.

A second factor that was of overwhelming importance in achievement was good health and simple longevity. This might be because personal productivity has some correlation with achieving eminence. Though there are exceptions in history such as Mozart or Shelley, our studies reveal the overwhelming importance of living to an old age (Bullough et al., 1970; Bullough et al., 1978; Simonton, 1975a).

The median age of death for those in the Scottish sample was 75, while the median age of death for the ordinary Scotsman who survived his first year was 40. Since statistical data for more detailed analysis was available for Scotland we found that 1 per cent of all people in Scotland who lived past 80 were significant intellectual or creative achievers. In the fifteenth

TABLE 2 Age at death of eminent Florentine achievers.
(n = 158) (many unknown)

Age Range	No.	Percentage
Uncertain or Debatable	6	4
Under 30	1	1
31-40	11	7
41-50	21	13
51-60	40	25
61-70	31	20
71-80	33	21
81-90	15	10
		101%

century the median age of death for the achievers was somewhat lower, age 61, but still significant since the median age of the population was under 20, and those who survived their 21st birthday probably died a decade earlier than they did in eighteenth-century Scotland. Thirty-one per cent of the achieving group lived beyond 70 years of age. (We should add that this figure might be challenged since there are many more unknowns in Italy than in Scotland.)

We did not try to date at what period in life the most significant intellectual and creative accomplishments took place, simply because, in spite of the work of some of our predecessors, we found that this in most cases was impossible to do. We could not agree on what was the most significant achievement or exactly when it took place. We did conclude that though in most cases an original and creative inspiration that eventually served to distinguish an individual had usually taken place before that person reached 40, it most often was not recognized as such except by continual repetition or amplification. It might well be that there are important psychological variables present to account for this and which we could not measure. One reason for the amplification, repetition or continual experimentation and restatement is that the creative person feels his or her value has not yet been recognized. Our studies would indicate that one of the rewards of growing older is that one's accomplishments are gradually recognized. The animosities which a person faced as a young person begin to disappear and a new generation, unacquainted with the past, recognizes him or her for what has been accomplished. Because contemporaries of such individuals recognize them, later investigators do also. Later investigators might tend to value their achievement more or less highly than did their contemporaries, but almost all achieved some recognition either in their own lifetime or right after. Age was particularly conducive to achieving recognition in one's lifetime.

Another variable which proved important was length of schooling, particularly education in a university or some institution of higher education. Though this is contrary to the finding of Eisenman (1970), who stated that creativity might actually decrease as a function of educational level, we felt that our definition of creative and intellectual achievement was different from his, and our findings, valid. Eisenman studied the education of student nurses: emphasis was placed on inculcating certain attitudes and ideas and where individual creativity is discouraged. This might also have been true in terms of the individuals in our sample, but since we were not

measuring their creative and intellectual achievement as students but as significant adults, Eisenman's results seem not to be pertinent. Our studies seem to imply that, in most areas, there is a significant amount of subject matter or skill to be acquired before achievement can begin, and this subject matter or skill is probably most easily acquired in educational institutions. Statistically, in both the eighteenth century and in the fifteenth century, length of schooling turned out to be far more significant than social class. Similar findings were found for the fifteenth-century Florentine achievement where 24 per cent had attended the university. The most significant variable was exposure to a university education or to similar institutions in the arts or other areas.

It is possible, however, that the correlation between length of schooling and achievement is predetermined by the way in which we chose our sample. This is because we believe that the university by its existence has defined achievement to fit its curriculum. It has institutionalized knowledge and, by so doing, has determined what does or does not constitute achievement. This means that those fields which are not in the university curricula or which lack some tie in (as technology does through engineering) tend not to have their leaders identified as significant creative or intellectual achievers. Though vari-

TABLE 3 Eighteenth-century Scotland: social class of parents compared with achiever's length of schooling.

(n = 302)

Achiever's Length of Schooling	Social Class of Parents			
	Upper	Upper Middle	Lower Middle	Lower
None	13% (3)	11% (1)	4% (3)	2% (2)
Some up through Grammar School	17% (4)	18% (30)	35% (23)	35% (10)
Some University	52% (12)	38% (64)	30% (20)	21% (6)
University Graduate	17% (4)	44% (75)	30% (20)	38% (11)
Total	99% (23)	101% (170)	99% (66)	101% (29)

Some of these groups had private tutors but no formal schooling.

ous creative arts, for example, have often been outside the university curricula, the history of art traditionally has been a university subject and so artists have achieved recognition. Not all arts, however, have shared in this recognition because the bias in history of art until recently has been in favor of what might be called the male arts. Thus women's contributions in the arts have been overlooked and do not figure in our studies of achievement as much as they probably should, simply because quilting, weaving, crocheting, innovative clothing design and so forth have been ignored in the institutional study and teaching of art. Nursing might serve as another example. Few nurses achieved recognition in the standard biographical collections of American women because their area of intellectual and creative achievement was not regarded as significant by the institutional determiners of what constituted achievement. Thus a Lillian Wald might achieve recognition for her creativity and eminence but primarily because her creative achievements came to be known outside of nursing.

Why have women been underrated in the ranks of significant intellectual and creative achievers? One of our tentative conclusions is that not only were they denied opportunities, such as schooling, which looms so important, but also because their areas of creativity and intellectual achievement have not been highly rated by the male oriented society. Women are best able to be recognized as achievers when they have accomplishments in a field dominated by men, where the male rating system is already well established.

Since formalized schooling was so important, it almost inevitably followed that a major key to achievement was the exist-

TABLE 4 Collegiate and noncollegiate schools tabulated with the number of eminent men educated in Paris.

(n = 194)

Number of Eminent Men	Type of Schools	
	Paris (noncollegiate)	Collegiate
None	65% (n = 108)	11% (n = 3)
One	31% (n = 52)	33% (n = 9)
More than One	4% (n = 7)	56% (n = 15)

Chi Square +65.76 with two degrees of freedom; P<.001

ence of major urban centers. Achievers tended to either come from urban centers or move to urban centers as adults and it was in the urban center where their achievements were recognized. Rural isolation is a handicap to achievement, either because the opportunities for education are lacking, or because the essential interchange of ideas with others in the field is nonexistent.

In our Scottish studies we were most effectively able to demonstrate the importance of urbanization. Scotland had a semi-official but more or less accurate census in both 1755 and 1790, and an official census in 1801, and at ten year intervals thereafter.¹

There was a strong correlation between population of the parish, size of parish (smallest geographical) and urban status of the parish and achievement (significance to the .001 level). Achievers also tended to come from those parishes which were growing rather than those which were declining. We also found that the contributing parishes tend to be more wealthy.

The single most important factor, however, was the nature of the commitment of the parish to its educational system (Bullough, 1970).

Most of the sample parishes had some kind of school. Of the 246 parishes only 16 (7 per cent) definitely lacked a parish school, although there were 27 (11 per cent) about which we were unable to find this information. Some 76 (31 per cent) had only one parish school, probably an English school, where instruction was in English, and English grammar, writing and simple arithmetic were the standard courses of instruction. Some 62 parishes (26 per cent) had a Latin or a grammar school in which the students were also officially taught Latin. In eighteenth-century terms this was a more expensive and more sophisticated school to operate than a simple parish school. A total of 47 parishes (19 per cent) had more than one school. Most schools, however, were what would today be called one room schools, and only 27 parishes (11 per cent) had collegiate schools with more than one teacher. It was these latter schools which were attended by eminent men in most significant quantities.

¹The census of 1755 was taken by Alexander Webster who relied primarily upon ministers of the Church of Scotland for his information. He estimated that there were 1,265,380 people in Scotland and while his reckoning has some elements of guesswork, there is little doubt that his final calculation, came very near the mark (Gray, 1952). The 1790 census was included as part of the reports gathered together by Sir John Sinclair (1801-02). The official census begins in 1801, and continues on (Census, 1831). Total population in 1801 was 1,608,420.

Only three parishes identified as having collegiate schools failed to produce eminent men. In other words, 89 per cent of those parishes identified as having collegiate schools produced eminent men, while only 35 per cent of those parishes without a collegiate type school did. Similar results were found for Florence, where 63 per cent of the achievers were from the city of Florence itself. The nature of the Florentine schools differed and detailed information was harder to find. What seemed obvious, however, was that the commitment of a community to its educational institutions was a significant factor in predicting who would achieve.

The nature of urbanization and community resources also appeared in another finding. In Scotland, the Society for the Propagating of Christian Knowledge (SPCK) often established temporary schools in the more rural parishes. However, in terms of producing eminent intellectual or creative achievers, their efforts have to be dubbed a failure. In fact hospitals and workhouses in urban areas contributed far more than did the SPCK parishes. This might be explainable in terms of a rural versus urban population since the hospitals and workhouses with their attached schools were more likely to be in urban parishes where educational opportunities ultimately were more plentiful, and, for the very bright students, more available. This was simply not the case in the rural areas. Similar findings appeared in the area under control of Florence where the more rural and isolated small towns did not contribute significantly.

Other variables which seem to be important are the intellectual milieu in which the achiever worked. Few worked in isolation. Most worked with other individuals either in a university or academic setting, or in groups of one kind or another. In Florence at least 61 per cent were involved with others in the group and the more data that we had the more likely we were to show connections — a strong indication that probably all were so involved. The most significant individuals were usually associated with others, somewhat less significant persons who might have been regarded as achievers at least in part because of their relationship to the significant achiever.

In general our studies tended to indicate that intellectual and creative achievement is both an individual and a societal effort. This is evident by the fact that more achievers in Florence were in the visual arts than was the case with Scotland. Painting and sculpture was overrepresented in Italy, underrepresented in Scotland, and this tended to indicate that creative and intellectual individuals are probably encouraged by society to enter

certain fields. Education then becomes extremely important, but so is urbanization, and the commitment of resources whether public or private to the kind of institutions which train or encourage creativity. Thus the periods of greatest creativity and achievement in history have been periods in which urbanization was a major factor so that intellectuals could band together. This can happen without cities, as it did in Charlemagne's roving palace school, but it is easiest in a more set and settled location. In short achievement required a societal and institutional commitment, as well as the potentially creative or intellectual achiever.

- REFERENCES
- ARIETI, S. *Creativity: the magic synthesis*. NYC: Basic Books, 1976.
- BARRON, F. Originality in relation to personality and intellect. *Journal of Personality*, 1957, 25, 730-742.
- BULLOUGH, B. & BULLOUGH, V. Historical sociology: intellectual achievement in eighteenth century Scotland. *British Journal of Sociology*, 1973, 24, 418-430.
- BULLOUGH, V. Intellectual achievement in eighteenth century Scotland. *Comparative Education Review*, 1970, 14, 90-102.
- BULLOUGH, V. *The scientific revolution*. NYC: Holt, Rinehart, 1970; Krieger, 1978.
- BULLOUGH, V. Achievement, professionalization and the university. In Paquet, J. & Ljseijn, J. (eds.), *Les Universites a la fin du moyen age*. Louvain, 1978.
- BULLOUGH, V. Dissenting thought on intellectual and creative achievement. *The Humanist*, 1980, 40.
- BULLOUGH, V. & BULLOUGH, B. The computer, the historian, and some variables of achievement. *Computer Studies*, 1973, IV, 117-123.
- BULLOUGH, V., BULLOUGH, B. & MAURO, M. Age and achievement: a dissenting view. *The Gerontologist*, 1978, 18, 584-587.
- BULLOUGH, V. L., BULLOUGH, B., VOIGHT, M. & KLUCKHOHN, L. Longevity and achievement. *Omega*, 1970, 1, 115-119.
- BULLOUGH, V. L., BULLOUGH, B., VOIGHT, M. & KLUCKHOHN, L. Birth order and achievement in eighteenth century Scotland. *Journal of Individual Psychology*, 1971, May, 27, 80-81.
- COX, C. M. *The early mental traits of 300 geniuses*. Palo Alto: Stanford University Press, 1926.
- DREVDAHL, J. E. Factors of importance for creativity. *Journal of Clinical Psychology*, 1956, 12, 21-26.
- EISENMAN, R. Creativity change in student nurses: a cross-sectional and longitudinal study. *Developmental Psychology*, 1970, 3, 320-325.
- EISENMAN, R. & ROBINSON, N. Complexity-simplicity, creativity, intelligence, and other correlates. *Journal of Psychology*, 1967, 67.
- GALTON, F. *Hereditary genius*. NYC: Appleton, 1870.
- GOWAN, J. C. & OLSON, M. The society which maximizes creativity. *Journal of Creative Behavior*, 1979, 13, 194-210.
- GRAY, C. E. An analysis of Graeco-Roman development. *American Anthropologist*, 1958, 60, 13-30.
- GRAY, C. E. An epicyclical model for western civilization. *American Anthropologist*, 1961, 63, 1014-1037.
- GRAY, C. E. A measurement of creativity in western civilization. *American Anthropologist*, 1966, 68, 1384-1416.

**History and Creativity:
Research Problems and Some Possible Solutions**

- GUILFORD, J. P. *The nature of human intelligence*. NYC: McGraw-Hill, 1967.
- HUDSON, L. *Contrary imaginations*. Baltimore: Penguin, 1966.
- KOOEBER, A. L. *Configurations of cultural growth*. Berkeley: University of California Press, 1944.
- McNEMAR, O. Lost: our intelligence? Why. *American Psychologist*, 1964, 19, 871-882.
- NAROLL, R., BENJAMIN, E. C., FOHL, F. K., FIRED, M. J., HILDRETH, R. E. & SCHAEFER, J. M. Creativity: a cross-historical pilot survey. *Journal of Cross Cultural Psychology*, 1971, 2, 181-188.
- ROE, A. *The making of a scientist*. NYC: Dodd, Mead, 1952.
- SIMONTON, D. K. The social psychology of creativity: an archival data analysis. Unpublished doctoral dissertation, Harvard University, 1974.
- SIMONTON, D. K. Age and literary creativity: a cross-cultural and transhistorical survey. *Journal of Cross-Cultural Psychology*, 1975, 9, 259-277. (a)
- SIMONTON, D. K. Sociocultural context of individual creativity: a transhistorical times-series analysis. *Journal of Personality and Social Psychology*, 1975, 32, 1119-1132. (b)
- SIMONTON, D. K. Biographical determinants of achieved eminence: a multivariate approach to the Cox data. *Journal of Personality and Social Psychology*, 1976, 33, 218-226. (a)
- SIMONTON, D. K. The causal relation between war and scientific discovery: an exploratory cross-national analysis. *Journal of Cross-Cultural Psychology*, 1976, 7, 133-144. (b)
- SIMONTON, D. K. Ideological diversity and creativity: a re-evaluation of a hypothesis. *Social Behavior and Personality*, 1976, 4, 203-207. (c)
- SIMONTON, D. K. Interdisciplinary and military determinants of scientific productivity: a cross-lagged correlation analysis. *Journal of Vocational Behavior*, 1976, 9, 53-62. (d)
- SIMONTON, D. K. Philosophical eminence, beliefs, and Zeitgeist: an individual generational analysis. *Journal of Personality and Social Psychology*, 1976, 34, 630-640. (e)
- SIMONTON, D. K. The socio-political context of philosophical beliefs. *Social Forces*, 1976, 54, 513-523. (f)
- SOROKIN, P. *Social and cultural dynamics*. NYC: Bedminster Press, 1937-1941. (4 vols.).
- SOROKIN, P. *Social philosophies of an age of crisis*. Boston: Beacon Press, 1950.
- SOROKIN, P. *Social and cultural dynamics* (1 vol. ed. rev.). Boston: Porter Sargent, 1957.
- WALLACH, M. A. & KOGAN, N. *Modes of thinking in young children*. NYC: Holt, Rinehart, 1965.
- WALLACH, M. A. & WING, C. W. *The talented student*. Holt, Rinehart, 1969.
- YAMAMOTO, K. *Role of creative thinking and intelligence in high school achievement*. NYC: Holt, Rinehart, 1965.

Vern L. Bullough, Dean, Natural & Social Sciences.

Address: State University College (Buffalo), 1300 Elmwood Avenue, Buffalo, New York 14222.

Bonnie Bullough, Dean, School of Nursing.

Address: State University of New York at Buffalo, Buffalo, New York 14226.

Maddalena Mauro, Department of Italian.

Address: California State University at Northridge, Northridge, California 91330.