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Natural Science

The essential wildness of science as a manifestation of human behavior is not generally perceived. As we extract new things of value from science, we also keep discovering parts of the activity that seem in need of better control, more efficiency, less unpredictability. We'd like to pay less for it and get our money's worth on some more orderly, businesslike schedule. The Washington planners are trying to be helpful in this, and there are new programs for the centralized organization of science everywhere, especially in the biomedical field.

It needs thinking about. There is an almost ungovernable, biologic mechanism at work in scientific behavior at its best, and this should not be overlooked.

The whole scientific enterprise must be arranged in such a way that the imaginations of different human beings can be pooled, and this is more a kind of game than a systematic business. It is in the abrupt, unaccountable aggregation of random notions and intuitions, known in science as good ideas, that the high points are attained.

The most mysterious aspect of difficult science is the way it is done. Not the routine, not just the fitting together of things that no one had guessed at fitting, not the making of connections—these are merely the workaday details, the methods of operating. They are interesting, but not as fascinating as the central mystery, which is that we do it at all and that we do it under such compulsion.

I don't know of any other human occupation, even what I have seen of art, in which the people engaged in it are so caught up, so totally preoccupied, so driven beyond their strength and resources.

Scientists at work have the look of creatures following genetic instructions; they seem to be under the influence of instinct. They are, despite their efforts at dignity, rather like young animals engaged in savage play. When they are near an answer, their hair stands on end, they sweat, they are awash in their own adrenalin. To grab the answer, and grab it first, is for them a more powerful drive than feeding or breeding or protecting themselves against the elements.

It sometimes looks like a solitary activity, but it is as much the opposite of solitary as human behavior can be. There is nothing so social, so communal, so interdependent. An active field of science is like an immense intellectual anthill: the individual almost vanishes into the mass of minds tumbling over each other, carrying information from place to place, passing it around at great speed.

In the midst of what seems to be a collective derangement of minds, with bits of information being scattered about, torn to shreds, disintegrated, reconstituted, engulfed in an activity that seems as random and agitated as that of bees in a disturbed part of the hive, there suddenly emerges, with the purity of a slow phrase of music, a single new piece of truth about nature.

In short, it works. It is the most powerful and productive thing human beings have learned to do together in many centuries—more effective than farming, or hunting and fishing, or building cathedrals, or making money.

It is instinctive behavior, in my view, and I do not understand how it works. It cannot be prearranged in any precise way; the minds cannot be lined up in tidy rows and given directions from printed sheets. It cannot be done by instructing each mind to make this or that piece for central committees to fit with the pieces made by other instructed minds. It does not work this way.—LEWIS THOMAS, *Dean of Medicine, Yale University, New Haven, Connecticut 06510*

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