

Mr. DADDARIO. We would have less problems getting support that way than to just recommend that a new agency be created.

Dr. GATES. Not a new agency.

Mr. DADDARIO. The national foundation, as I have seen it structured, has within it sufficient flexibility so that support for these very ideas that you so ably put before us today could be properly generated.

Dr. GATES. Let me mention one more thing in this context. There are quite a few institutions that could handle the training of ecologists for the next few years very effectively and of systematists. The institutions exist. Some of the manpower exists. It would stretch us some. We would be very hard pressed in certain areas, but we could undertake, straightaway, if funding were available, the appeal, begin to attract young people into the field and train them at a number of our great centers in this country. I just want to make that point. Centers do exist for training in the areas with which we are concerned for the IBP. These include universities, they include some of these great systematics Institutions that I mentioned earlier. But the Ecological Institute is something for the future, over and above this.

Mr. DADDARIO. How many ecologists do we have?

Dr. GATES. If you look at the roster of the Ecological Society of America—I would have to be reminded here, I am just guessing, 3,000 members, 2,500—3,000 are members of the Ecological Society. I don't think this is an answer to your question because this includes vast numbers that are interested in ecology but are not really ecologists.

Mr. DADDARIO. They have sort of an affiliated membership?

Dr. GATES. They are direct members but—

Mr. DADDARIO. How about theoretical ecologists?

Dr. GATES. Less than a half dozen; scarcely that.

Mr. DADDARIO. When you talk about the need for theoretical ecologists, what do you envisage?

Dr. GATES. I envision quite a new thing that has not existed, and that is people trained in ecology as it now exists with strong fundamental work in biology, but in addition good training in physics, and good training in mathematics and the use of computers. By theoretical ecology, I mean those people who can take the data that is accumulated in the field from observation and bring it onto their desk and organize it and derive from it causes and effects and out of this theory. Hypothesis and theories really pull all the threads together into a coherent fabric which will give ecology a real body.

You see, the difficulty at the present time—this subject is so complex and so diverse if you look in the literature, there are vast amounts of data, of wind, of radiation, of moisture, of water, of plants and animals and all the characteristics, and that is it. It is descriptive. We need to pull this all together into coherent models that show the events, the cause and effect, the way things go, the laws that exist in ecology, whether it is population dynamics, whether it is the food chain, whether it is an interaction of the atmosphere with the plants and the animals; I happen to be involved in this quite deeply in my own work and that is why I feel so strongly. This, in fact, is the reason I gave the introduction that I did, that I was trained in physics, experienced in geophysics and came back into ecology.