A PROPOSAL
TO
THE W.K. KELLOGG FOUNDATION
FOR MATCHING FUNDS
TO ESTABLISH
A NEW ENGLAND FARM CENTER
AT HAMPshire COLLEGE

Amherst, Massachusetts

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ABSTRACT

Hampshire College proposes to establish a New England Farm Center, which will be the organizational nucleus of (1) a demonstration program to assist in the revitalization of the New England agricultural economy, linked to the New England Cooperative Extension network to disseminate the program's results; and (2) an undergraduate program in agricultural studies, within the College's School of Natural Science. This proposal requests $229,000 in matching funds over three years to establish the Center and develop the demonstration program.

The goals of the Center are to help New England farmers, especially those involved in small and part-time farming, to revive the region's agriculture; and to produce graduates with a fuller understanding of this nation's agricultural systems.

The planning stage of the demonstration program has been carried out over the past two years. The development stage will extend over the next three years, beginning in early 1979. During the third year, extensive evaluation of the individual demonstration projects will take place, and completed or weak projects will be weeded out and new ones phased in.

The College is sharing in the financial responsibility for the development of the Center, and once it is in operation will fund significant portions of its continuing operation out of the annual operating budget.
1. Present Day New England Agriculture

Although the northeast United States contains some of the best farmland in the world, 80-90% of the food consumed here is grown elsewhere, and the amount of land under active cultivation has been declining steadily for over one hundred years. In the mid-nineteenth century, New England farmers raised nearly all of their own food and exported a major portion to the rest of the nation. Flocks of sheep, for example, grazed everywhere: there were 350,000 sheep in Massachusetts alone. Today flocks of sheep are rare, with the Massachusetts census at only 8,000. In contrast, consumption remains high: Massachusetts consumes 19 million pounds of lamb and mutton annually and has the highest per capita consumption rate in the country.

The decline in production and the attrition of farm acreage began soon after the Civil War with the opening of the great, flat grazing lands of the Midwest and West where efficient mass production techniques could be applied. The new advantage was in labor productivity: the existence of great areas of land and relatively cheap rail and canal transportation elevated the economic advantage of labor productivity and efficiency over both land productivity and energy efficiency. The western agricultural products came east at prices eastern farmers could not meet. The relatively energy-efficient and land-efficient New England farmers switched first to dairy and other kinds of production and then increasingly out of farming altogether, and the amount of acreage committed to livestock—along with much of the quality of rural life associated with the economy it generated—began its long-term decline.

Two other pressures accelerating the move out of sheep production were the new federal and state regulations brought into being to handle the huge slaughterhouses in the Midwest, and the problem of predators. The new slaughterhouse regulations forced small regional and local slaughterhouses, which served farmers in outlying rural areas, to close, since they could not afford to comply with the costly requirements. This made it difficult and finally impossible for producers on family farms to slaughter their own animals for sale. Roving packs of domestic dogs and coyotes have been a traditional problem and now represent a major obstacle to the expansion of the sheep industry.

The tide of this century-long decline has recently begun to reverse, mainly because of the rising cost of energy, which is bringing about the return to economic importance of an agriculture with greater land productivity and energy efficiency. We now recognize more clearly that land is not limitless; petrochemical fertilizers are increasing in price; big machines are expensive to run (and maintain and replace); transportation, now almost exclusively by truck, is extremely costly and becoming more so every year. As a result, the comparative economic advantage of the West’s large-scale agriculture is decreasing rapidly.
The energy crisis appears to be the major factor in the revival of interest in New England farming. But there has also been a change in attitude developing since the mid-1960's, resulting in increased interest in the revival of rural life and the agricultural economy needed to sustain it. As such attitudes work their way into government policy making, they are making possible the flexibility in regulations necessary for the operation of regional slaughterhouses. In Massachusetts the new mood has already brought about changes in land taxation policy, providing farmers and agricultural communities in rapidly developing areas (where tax rates are escalating) protection against the inflation of property values.

The Midwest and West competed successfully with New England in the last century, and captured most American livestock production. Now, however, the problem is no longer one of regional competition. Most our lamb and wool are currently imported. U.S. protection has sunk to the point where the Australian sheep industry is concerned about the decline, fearing the total disappearance of our market. In a time of world food shortage, we can no longer afford to ignore New England's agricultural potential. Its hilly, marginal lands can never match the grain crops and rich soil of the Midwest, but they can produce sheep and help to stabilize and increase a rapidly sinking market.

Because of these developments, New England's small and part-time farmers are in an improving position to undertake a renewal of their traditional brand of efficient farming. Modern knowledge about agriculture and modern technology are ready to help them, and their land, especially in outlying areas, is still largely undeveloped. Further, if a revitalization of small farm agriculture can be carried out on a broad enough scale, a concurrent stimulation of related areas of the rural economy should follow. Development of the sheep industry, for example, would likely inspire and require development of related cash crops and present opportunities for small industries producing such equipment as special fences, shears, and lamb-feeders. An expanded sheep industry would also provide opportunities for cottage industries to spin, weave, and knit the locally produced wool and to employ the elderly and handicapped in meaningful and profitable work.

All of this is possible over the next decade. But several major obstacles have developed during the last fifty years of depressed agriculture that must be overcome if any revitalization is to take place. A revised sheep industry faces at least three:

(1) The types of sheep which have become established in the United States during this century have been bred for large farm and western range conditions. They are not suitable for taking advantage of the very different terrain, climate, and small farm conditions of New England.

(2) With the attrition of farm acreage and its reversion to forest, the Eastern Coyote has returned to the New England countryside; also, the number of domestic dogs hunting and harassing sheep has multiplied dangerously.
In combination, these two types of predators now represent the major obstacle to a revived sheep industry.

(3) The cost of feed has risen to the point where the only economic way to raise small flocks of sheep and herds of other livestock is to graze them. At present the lack of research on suitable high protein forage crops is an obstacle to a widespread substitution of forage for grain feed.

To make possible a full-scale return to a highly productive, widespread, and self-sufficient regional agriculture, thorough investigation of obstacles like these and demonstration of practicable ways to overcome them are needed soon. We must capitalize on all available knowledge -- both new and old -- about livestock and forage crops. For example, trials of new breeds of sheep particularly suited to the available land and to small farm conditions could make livestock farming more attractive and profitable to farmers than it currently is. Second, new applications of successful old world techniques involving livestock guarding dogs appears to be the long sought breakthrough to a practical, economical, and ecologically sound solution to the escalating predator problem. Finally, the application of modern knowledge about high protein legumes to the study of forage crops could bring into use areas of underdeveloped and underused lands, and successful research into the nitrogen-fixing characteristics of such plants could lessen the dependence on petrochemical fertilizers.

To help set in motion the needed investigation and demonstration, specific programs are required in which research is coordinated. Property organized and connected to the surrounding region through cooperative extension, such programs could get this important task underway. The alternative, a continuation of the present scattered and independent efforts, offers little chance of success. If New England farming is to have any real chance of returning to the level of economic health and self-sufficiency of the past, and if its rural life and the beauty of its natural landscape are to return to anything approaching their nineteenth century quality, no decentralized and disorganized approach will do.
2. The New England Farm Center at Hampshire College

Hampshire College proposes to establish the prototype of an agricultural center and to link this to an undergraduate program in agricultural studies.

In early 1979, provided sufficient funding has been secured, the New England Farm Center at Hampshire College will begin operation on a several hundred acre farm at the northern end of the college campus in South Amherst. The Center will be dual in function. First, it will be engaged in investigation, demonstration, and extension to assist New England farmers in addressing the major obstacles to a revived agricultural economy. In this role, the Center will be formally associated with the New England Cooperative Extension network. Second, it will also be the nucleus of an undergraduate educational program in agriculture, through which the Hampshire College faculty (and distinguished visiting faculty) who constitute the Center's personnel will introduce students to the study and practice of natural science by means of agriculture. Students will carry out individual and group projects in applied agriculture on the demonstration farm, which will serve as the educational program's laboratory in addition to being the Center's facility for research.

The first assignment the Center will undertake is a program aimed at contributing to the revival of sheep farming. To our knowledge, the program will be the first of its kind to integrate a variety of efforts to overcome the three principal obstacles we have identified. The Center will be engaged in the development of cross breeds of sheep particularly suited to the climatic and natural forage conditions of New England and the prevalence of small farms here; it will be engaged in the breeding and training of selected varieties of European livestock-guarding dogs, which offer inexpensive and ecologically sound protection against predation by coyotes and domestic dogs; and it will be engaged in the development of alternative varieties of forage and the investigation of common New England woodland and roadside plants to assess their nitrogen-fixing ability, palatability, and nutritional value.

Sheep Project

Sheep are efficient on marginal land, producing high quality meat without grain supplements and supplying milk and wool. Farmers trying to raise sheep in twentieth century New England need hardy breeds, adapted to local climate and forage conditions. Most U.S. commercial sheep flocks have undergone stringent selection against twinning because twins do not survive well on large western ranges. On a small New England farm, however, twin lambs have a much greater chance of survival. Twinning is a good example of a single genetic trait, relatively easy to select for, which provides a significant difference in productivity. Producing meat in New England requires selection for qualities inherent in breeds other than those the western ranches have made popular. One breed with potential for
New England is the Wiltshire Horn, reputed to have a lambing rate of 160 percent (100 ewes produce 160 lambs), with lambs gaining one pound per day on good forage alone. The Wiltshire is a self-sufficient breed, well adapted to moving about and foraging efficiently, thus making good use of available forage. It produces large quantities of milk, provides excellent "mothering" of lambs, and can be bred out of season to produce lambs for the Easter market. These lambs offer the advantage of early marketability without the added risks and costs of holding them through until the fall when most lambs are marketed and the price tends to decline.

There is evidence that many of the best sheep producers have lambing rates of only 150 percent or less. This rate can be improved substantially, first, by rigid selection of replacement breeders and the rejection of all singletons for breeding purposes, and second, by introducing the blood of the Finnish Landrace. This breed is noted for its ability to produce from two to five (and more) lambs per gestation and, perhaps more to the point, for its ability to transmit its fecundity when crossed with other breeds. The Finn has less desirable carcass qualities than the Wiltshire or the Dorset, but the tendency in most crosses is for the carcass quality of the other breed to dominate.

All three breeds are relatively free of lambing problems; the Wiltshire and Finn, especially, have rather narrow skulls which makes for easier lambing. This is a desirable attribute, particularly for part-time or less experienced farmers who may not always be available, or who may not know how to assist, when lambing occurs. A combination of these three breeds may prove to be nearly ideal for the needs of many small farmers and, by providing successful experience, could encourage an increase in flock size and/or flock numbers.

Professor Slater, a former sheep farmer, has already been offered stock of several minor breeds, collected and bred in the U.S. by the American Minor Breeds Conservancy, Old Sturbridge Village, and by individuals. Continued trials of these breeds and travel to other parts of the world where sheep are raised under conditions similar to those of New England will be an important part of the Center's activities.

Livestock Dog Project

Wild canids, whether wolves, coyotes, foxes or dingos, have always taken their toll of sheep on every continent. Recently, the population of large, free-ranging wild and domestic canids in the United States has increased rapidly, and the damage they have done to New England's small flocks and to the range flocks in the West has been devastating. The erection of dog-proof fences is usually prohibitively expensive, and it is useless for protecting livestock whose major values lies in their ability to range widely over marginal lands. In the western states, poisoning programs have drawn bitter criticism; resulting legislation has, in turn, been followed by an increase in the number of coyote and wolf attacks. Eliminating wolves or
coyotes is not a satisfactory answer on either practical or ethical grounds. It also disrupts the balance of nature, permitting population explosions of rodents and other small animals that are considered vermin in agriculture and that often compete for forage with domestic animals.

European shepherds have traditionally relied upon partnership with livestock-guarding dogs, which often wear spiked collars, to deter wolves or bear. Most of these breeds have been selected for their ability to work with minimal human guidance. The canid specialist at Hampshire College, Professor Ray Coppinger, believes that independent guarding dogs represent the most economical and efficient way to protect sheep and other livestock. With the support of the Winrock International Livestock Research and Training Center, another anonymous foundation, and Hampshire College, Ray and Lorna Coppinger have visited areas in eastern and western Europe where wolves are still a problem and dogs are used to guard sheep. During the summer of 1977, they talked with farmers, herders, and breeders both in the western U.S. and in Europe and began collecting breeding stock. Sixteen young dogs from Yugoslavia, Turkey, Italy, and Scotland were raised at the Coppinger's kennel in nearby Montague, Massachusetts. These animals will be demonstrated at the Hampshire Farm Center and area farmers will be provided with pups in an effort to provide protection against predators.

Professor Coppinger has selected different breeding stocks for different conditions such as climate and range. He intends to breed and train the dogs for their particular advantages on New England farms and has already begun to place them on small New England sheep ranches suffering from canid predation. Farmers throughout New England have volunteered for trials with these dogs.

Forage Project

Part of any future success with sheep will depend on improved, economically feasible methods of providing feed and pasture land for the flocks. The Commissioner of the Massachusetts Department of Food and Agriculture, Frederick Winthrop, Jr., recently stated his belief that the improvement of forage crops in Massachusetts was a desirable goal. New methods of planting and cultivating leguminous forage crops can be developed for use in those New England fields that are not considered productive by large-scale agricultural practices. As is the case with most U.S. sheep-breeding programs, improvements in forage have been concentrated around the needs of the western rangelands. It is not known whether this knowledge is applicable to New England; during the past fifty years, no one has tried to apply it here.

Professor John Torrey of Harvard University's Cabot Foundation for Botanical Research, in nearby Petersham, believes that new methods of planting and cultivating nitrogen-fixing forage plants can have profitable results for New England
farmers. Professor Torrey's expertise includes the physiology of both legumes and non-legumes which replenish the soil's nitrogen by symbiotic nitrogen fixation thus lessening the need for petrochemical-based fertilizers.

Professor Torrey plans to teach courses at Hampshire in alternate years, and to coordinate forage projects. Among his priorities will be the planting of legumes in with other feed crops, and the use of symbiotic nitrogen-fixing, non-leguminous brush species such as alders, autumn and Russian olives, and similar nitrogen-fixing shrubs, for longer-term upgrading of pastures. Methods developed for improved forage in major sheep-raising countries like New Zealand and parts of Europe will be adapted to New England climate and growing conditions.

Production, Distribution, and Marketing Project

Any proposal to expand the sheep industry in New England must address the need for more than the two existing government-inspected slaughterhouses, and for rebuilding the now largely inadequate local/regional marketing and distribution system. This is a fourth area study, which is still under preliminary analysis but which is likely at some early step in the development of the Center's program to evolve into a fourth investigation project.

New England is in the paradoxical position of having the market for lamb without adequate production or distribution mechanisms for reaching that market. There are many reasons for this. New England's small, scattered producers have not allied closely enough or been numerous enough to form either an effective buying bloc for items such as medications and equipment, or an effective selling bloc for their products. These problems have combined to increase their difficulties. For example, when Searle stopped producing vaginal sponges it became far more difficult to produce out-of-season lambs, so that local markets looking for year-round supplies were forced to drop local producers. In the meanwhile, New England's government-inspected slaughterhouses, which would like to handle more lamb and mutton, have been forced to concentrate on beef and pork meats for which New England producers operate at an economic disadvantage.

Professor Susan Goldhor, the Center's Director, has started seeking solutions, working with advanced students concerned with these problems. By keeping in contact with groups as diverse as local sheep producer associations, slaughterhouse owners, retail meat marketers, the national Sheep Industry Development Plan, the Food and Drug Administration, the manufacturers of products useful to the industry, and New England State Cooperative Extensions, she is finding where possible solutions may exist or where they can be developed.
The three (and ultimately four) coordinated projects are expected to move through three distinct phases:

I. The first phase has run for the past two years and amounts to preliminary feasibility and pilot studies. This phase has been completed this fall.

II. The second phase, for which the College now seeks funding, will be the development of the physical facilities for the Center and the actual running of the projects. Phase II will begin in early 1979 and run for three years.

III. The third phase will depend on the evaluation of the second; it will involve the continuation of those projects which still require work and the transition from completed projects to new ones.

The Center is envisioned as an ongoing enterprise whose individual programs change from one three-year period to the next, but whose overall purpose, the revitalization of New England agriculture and the re-introduction of agriculture into the undergraduate science curriculum, remains constant.

The pilot projects which have spurred the creation of the Center have been supported by planning grants from the Winrock International Livestock Center, the Massachusetts Society for Promoting Agriculture, and an anonymous foundation in Boston. The prospect of their integration in the Center's program has recently drawn the attention and support of the American Sheep Industry, which has decided to include the Center in its New England area program to test the possibilities for the expansion of sheep farming. Hampshire will be associated with the agricultural extension programs at the six New England landgrant institutions, through an extension coordinator funded by Winrock.

Hampshire will also make a major effort to extend the results of the Center's work beyond the New England area. News articles on the early work have appeared via Associated Press across the country, particularly in the West, and the Center's Outreach Specialist has plans to open lines of communication to those areas where there is particular interest in the livestock-guarding dog project.

The establishment of the Center and the implementation of its second phase have recently received the all-important support of a major challenge grant from the Sachem Fund in Connecticut. It is this challenge grant that has now put Hampshire College in a position from which it can approach other major funders. The minimum
The cost of developing the Center and running its sheep program for three years is $459,000, broken down annually as follows:

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<th>Balance</th>
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We propose that the Kellogg Foundation consider making Hampshire College a three-year matching grant of $229,000 to be appropriated in the amounts that complement the Sachem grant: $81,000, $74,000, and $74,000.