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REPORT

OF THE

COMMITTEE ON AGRICULTURAL SCHOOLS.

THE joint select committee, to whom was referred so much of the governor's message as relates to AGRICULTURAL SCHOOLS, have had that subject under consideration, and ask leave to submit the following

REPORT.

An Agricultural School, on any extensive and scientific plan, does not exist in this country. And in a field so vast and unexplored, the committee have deemed it proper to classify so wide a range of ideas, and to present some of the data which form the bases of their conclusions. They would, therefore, direct attention

I. *To the value of the agricultural interest.*

II. *To the nature of agriculture.*

III. *To the wants of agriculture.*

I. The value of the interest may be seen in the fact that agriculture, in the early stages of society, is the first and chief employment of man, and marks his transition from a savage to a civilized

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state. For, descending from his mountain caves, you find man side by side with the progress of husbandry, until he emerges on the plains below, where gush for him, in copious streams, as the result of that progress, civilization and its attendant blessings.

The magnitude of this interest may be seen in another direction—*its effects upon population.*

Population is the general rule that measures a people's greatness; and the governing law of population is *the facilities for its support.* There exists no restriction upon the prolific nature of plants, or animals, save as it is limited by nourishment. This inevitable law of food and population is written on the destiny of every nation. Mark it along the stream of life, from the sparsely peopled hunting tribes, through all the grades of pastoral and agricultural employments, until you meet the teeming millions of fertile China.

In this survey it will be found that population ever increases, on the whole, in the direct ratio of *agricultural production.** Thus, increases that production 50 per cent. and the population increases 50 per cent.

What are the effects of augmented population upon the interests of society?

1. Upon the *producer.* By so much as population is augmented is the market widened for his products; thus making a quicker and larger return for his capital and labor. And as production is the great source of wealth to all classes, and this wealth the means of developing new desires, producers, above all others, hold the instruments of wealth, since they alone can gratify those new desires which they have stimulated into being.

2. Upon the *consumer* this increased agricultural production, and corresponding population, is highly beneficial. By increasing that production in our State a hundred per cent., as may be done with the same outlay, the number of people, here or elsewhere, will be doubled by the process. If the new population reside *here*, each

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* "The population of a State is always proportionate to the sum of its production," Say's Political Economy. See also Malthus, on population.

person will have twice as many customers as before, with profits increased in that ratio; if *elsewhere*, the advantages are greater still; for to convey those products to another state or nation requires numerous other occupations. Is a cargo of corn, or other produce, to be sent out of the country? The drowsy mine awakes, and sends forth the axe and the saw,—the product of a hundred trades,—to the forest. The lumbermen catch the impulse, and anon the forest is at the sea-side, and a hundred other trades, thus brought into life, construct the stately vessel. Afloat, she must be *manned, loaded* and *cleared* for sea. Thus, agricultural production puts into action and profitable motion, the whole range of trades, arts and sciences—especially all those concerned in commerce and navigation.

Contemplated alone in its effects on other callings, the agricultural interest is vast beyond calculation. Its value as a distinct branch of business, may be seen in the fact that *three-fourths* of our people are engaged in that pursuit; and that the value of the agricultural products of this country, for the year 1847, as computed in the patent office reports, is the astonishing sum of *one thousand one hundred and forty-five million dollars*, or about *one-ninth* of the whole property, personal and real, in the United States.

II. *The nature of agriculture.*

Some fifty-five simple substances compose the earth, and its various objects. Those substances combined in a certain manner form the mineral,—combined differently the vegetable, and differently still, the animal kingdom. Take e. g. some dozen of those simple substances; combined in certain proportions they form *wheat;* those identical materials in the wheat pass into and become the *animal;* the same materials in the animal, decomposed by death, assume again their *native form.* Such then, is the wondrous round of matter,—first mineral, then vegetable, then animal, then back to mineral,—ever changing, but never lost!

Agriculture may therefore be defined, *that science which teaches the laws that govern those changes of matter; the art of agriculture, the supplying the means which make those laws operative.*

Hence the science of agriculture includes several other sciences: 1. Those which teach the nature and composition of the earth, which are chemistry, mineralogy, and geology. 2. Those which teach the nature and composition, the production and consumption of vegetables, which are chemistry and botany: and 3. Those which teach the composition and production of animals, which are chemistry, anatomy and physiology.

This view of the subject suggests how wide is the circle of agricultural science, and how imperious are,

III. *The wants of agriculture.*

These wants will best be seen by examples illustrative of the preceding subject.

In husbandry, an inquiry of primary importance is, what are vegetables? How do they grow, &c? It is found that they are organized bodies, differing but little from animals, and that they *eat* and *drink* with their roots, *breathe* and *feel* with their leaves, circulate vegetable blood along proper vessels, procreate with their seed, and must have clothing or warmth, which is the same thing. The science of botany affords this knowledge, the practical advantages of which will be seen by a few cases. If the rootlets are the organs through which plants are chiefly nourished, the need of preserving those rootlets, as in transplanting, and the importance, in all conditions, of a porous soil for their extension, is at once apparent. For otherwise treated, plants as truly perish from *hunger*, as animals whose mouths have been destroyed; and if the leaves are the organs of vegetable respiration, excessive pruning is a *consumption* as sure and fatal as that which consumes the lungs of animals.

Again—plants are composed of certain elementary materials, unvarying in the same species, and derived from the earth and the atmosphere—mostly the earth. If those materials exist naturally within the reach of plants, vegetation is spontaneous; if altogether absent, complete barrenness ensues; if partially present, plants will thrive but partially.

The only rational mode of culture, therefore, is, first to learn the precise materials which compose the crop intended; second, to

ascertain whether those materials are present in the soil; and third, if not, how to supply them. Chemistry furnishes this information.

The superiority of *scientific* over *experimental* farming shines forth in daily practice. Among the constituents of vegetable matter, some three per cent. is potash, lime or soda, derived exclusively from the soil. If those materials happen to be wanting, the experiment of applying them in proper quantity is successful; if not wanting, the result is as when the blind cook adds salt to the meat already seasoned, or saleratus to the dough now sufficiently charged. The same is true of plaster, bone or any other manure; applied with no intelligent views no certainty of success can bless the effort. Experimenting in this way succeeds, if at all, by the merest accident, and fails so often as to give a loss of property, annually, in the cost of material, and injury done the crop, as unnecessary as it is enormous.

Scientific procedure on the other hand insures success with mathematical certainty; she lays her hand upon the crop and bids it till its component materials—commands the earth to say what of those materials it has and has not, in store, and kindly suggests to furnish the deficient ones, in the exact proportion needed.

In the item of animal manures, so valuable to farming, an immense loss is yearly sustained, which the application of a few scientific principles would prevent. About twenty-three per cent. of animal products consists of an article called *ammonia*—better known as hartshorn,—and consequently the food of animals, and of the plants on which they feed, must be supplied with ammonia to that extent. Animal manures owe their utility, mainly, to the abundance of their ammonia, which, owing to its evaporating qualities is mostly cost, unless fixed in some way. In Liebig's celebrated agricultural work occurs this passage:—"It has been shown by a very simple calculation that the value of manure thus lost in the city of London amounts annually to several million pound sterling." Assume it to be one million, or about $5,000,000, and that the State of Maine has one-fourth the population of London, there is a loss to our State on these data of more than a *million of dollars*, and this annually.

Thus the want of that knowledge which directs how to prevent that loss, at small expense, is practically an annual *tax* upon the people to that amount. That knowledge agricultural schools would afford.

Another advantage of enlightened husbandry is seen in the production of stock. In the animal economy food subserves two important purposes. First, it supplies the materials of the body. The various animal tissues as bone, fat, flesh, &c., are composed of very different materials. Fat e. g. is found to contain precisely those elements which compose gum, starch and sugar; while muscular flesh consists of those found in seeds, as oats. In this way science suggests how at pleasure, and at a cost less than half that attending the present mode, one ox may be made *fat* for the shambles, and another *strong* for the draught service, by feeding on those articles having a like composition with the parts to be developed. Second—food is the great source of *animal heat.* The lungs serve mostly as a furnace into which, as *fuel,* a large quantity of the food is carried by the circulation of the blood. Into the lungs, too, and acting upon this fuel, the oxygen of the atmosphere is constantly rushing. Respiration, therefore, is nothing but a *slow combustion,* mostly for supplying that warmth without which animal being ceases.

It is a law in the production of heat that the more freely air is admitted into the furnace the faster the fuel is consumed; thus, as in animal heat, where moderate and long continued warmth is required, inducing unnecessary waste of material.

These principles apply with great force to the production of stock; for increased exercise is only another hand at the bellows, giving air to the furnace which consumes in proportion the fuel of the body. This explains the great heat experienced on exercise, and the fact that *swift animals are always lean.* How unwise, therefore, is that policy which allows domestic animals to roam at large, when the certain effect is, for every step taken, an increased demand for food.

Again—surrounding cold reduces the temperature of animals, as it does other objects,—a temperature maintained, as just shown, by

the consumption of food. Consequently that policy which allows living creatures to suffer unnecessary exposure to cold is to withdraw so much food from them.

From these two sources alone, the effect of exercise and of cold upon the consumption of food, there is, beyond doubt, a useless waste of property equal at least to half the cost of feeding,—a sum which, if saved, as science directs, would add immensely to the productive capital of the State—to individuals affording wealth where only competency exists, and competency where *poverty* now requites honest, but unenlightened toil.

Electric and atmospheric causes are at work for the agriculturist. Beneath their invisible, but omnipotent hand, the mountain is rent, and the solid rocks, little by little, crumbled to earth. There is no soil save as it results from that process. Those influences are but the *mill*, propelled by storm and lightning, which grinds the mineral corn that feeds the vegetable that nourishes the animal! But even here human knowledge is required to bring *the corn to the mill* (to the surface)—and to adjust some of the delicate rods which regulate the machinery; a wrong rod touched may reverse the engine, or crush the arm that pulled it. How important then is a knowledge of the nature, effects, and operations of those agents,—knowledge to be had only at those schools.

To the mass of minds, how rich a mine of knowledge, contained in numerous publications, is now lost, because sealed up in unknown language. Take doctor Jackson's report on the geology of Maine—a work rich in information to the farmer, and to every one; yet to all except a few it is as completely a sealed book as if written in Greek or Hebrew. Under the head of *Agricultural Geology*, (p. 79,) we read:—"Sienite and hornblende rock produce a dark brown soil in which there is but little quartz and a great deal of felspar." Here is truth of great importance to agriculture; but how many understand the terms *sienite*, *hornblende*, *quartz*, and *felspar*. Turn to a standard dictionary, and who becomes wiser? Worcester defines sienite "a rock composed of quartz, felspar, and hornblende;" if you turn for a definition of the words used in

the *definition* you find quartz defined "*a transparent mineral composed of pure silex.*" Such light is total darkness.

Liebig's great work on agricultural chemistry has an immense value, yet to the mere English or even classical scholar, it is worth less than so many blank pages—so abounding is it in those scientific terms. In nearly every line you meet *carbon, oxygen, humus, proteine, silica, per oxide*, &c., whose meaning is "past finding out" to the mass of readers.

Agricultural schools, therefore, by explaining those terms, would be the key to this immense treasury, laying open its long lost riches, and making them available to all.

Exchange of surplus commodities is one of the great objects of production. A farmer exchanges a hundred dollars worth of produce to-day for the goods of the merchant. Now if to-morrow those goods fall twenty-five per cent., it is obvious he receives but seventy-five dollars for his produce, since seventy-five dollars will now buy what he paid one hundred dollars for; and if the goods rise twenty-five per cent., he gets one hundred and twenty-five dollars for what he only asked one hundred dollars, since he can now sell his goods for that sum. The same is true if he exchange for *money*. If, as often happens, the quantity of money is increased by importation of specie or the issue of paper money, twenty-five per cent., he receives one hundred dollars in *name* but only seventy-five dollars in *reality;* because the value of money, as of other commodities, *falls* in proportion to its increase. If, on the other hand, the quantity of money be diminished twenty-five per cent., as often happens by exportation of specie, or the contraction of paper money, the one hundred dollars is worth one hundred and twenty-five dollars, because it has *risen* in proportion to its decrease. Thus in the one case he receives seventy-five dollars, in the other, one hundred and twenty-five dollars for produce valued at one hundred dollars.

From these illustrations it will be seen how important to every man is a knowledge of the principles which govern exchanges,—so important as to constitute, in many cases, the whole difference

between riches and poverty. For if, in all the departments of trade, one man succeeds better than another, it is because he better understands the principles which ever show the coming fluctuations of the market. This is the secret of every fortune, from banker Rothschild to the village merchant.

This knowledge concerning trade, currency, &c., is the science of *political economy*. And if those schools conferred no other benefit than the diffusion of this knowledge, every voice should bless them.

In all ages and countries, science has been considered too often as something above, and not adapted to, the mass of minds in the industrial pursuits of life; as a proud and haughty dame in lordly halls, whom toiling suitors may sue in vain. She is rather the good Samaritan at the well, to refresh and strengthen the poor and needy, and angel-like offers to share the burdens of the humblest laborer. She descends the smutty mines, bearing the safety-lamp, and bringing life to the miner where death lurked aforetime in horrid explosions. She is with the mason and the joiner, constructing the dwelling, and is the guardian genius of the rod that protects it from the thunderbolt. She is upon the sea and in the desert, directing the pathway of the wanderers. For the frail canoe she has given, and sent forth, the stately vessel, freighted with the works of her own hand. She is at the falls and erects the factory, endowing the dead machinery, as it were, with the attributes of human thought and action. Her glorious path is marked by the railway and the telegraph,—works alone which entitle knowledge to the reverence of mankind.

The committee have endeavored to show some of the advantages, resulting from the study and practice of agriculture as a science, in schools established for that purpose.

Are not existing schools, it is asked, sufficient for those objects? They are not; for no schools short of the ablest colleges are competent to instruct in those sciences, constituting, as already explained, the single science of agriculture; because very expensive apparatus, and able professors are essential to such instruction.

The best literary institution in our State—Bowdoin College—affords merely *incidental* instruction ; for it does not teach *those sciences as applied to agriculture*, or to any avocation. If they did so, such institutions would fail as now organized ; for a young man must devote two or three years, " preparing to enter," in studying the " dead languages,"—dead, indeed, and useless in this case ; four years more in the regular course,—altogether making an expense of time and money which few farmers can afford.

A new order of things, therefore, must be created—an institution expressly for that purpose, so provided with funds as to secure ample apparatus and able professors, with a department where the theoretical principles taught can be applied in practice. For such a school no long and costly preparation of Latin and Greek would be necessary, a good English education, such as our primary schools afford, being alone requisite for admission ; while the necessary manual labor would avert that harmful relaxation of the body,—too often of the mind,—which attends existing schools.

Similar institutions have been established in other countries with the happiest results. The limits of this report will allow but a single case, selected among many equally interesting.

An agricultural school was established near Paris, in France, in 1829, on 1500 acres of crown lands, and accommodates 600 pupils. In four years it paid its expenses, and four per cent. on the investment, and added 28,000 francs to the value of the property. After a thorough course embracing the science and practice of husbandry, the pupils graduate, a portion of whom become practical farmers, while others impart by lectures, in the departments, the knowledge received at the schools.

Why then in this great republic, whose *palladium* is *liberty*, itself the offspring of KNOWLEDGE,—why in Maine should not something be done for the elevation of labor, and the lightening of its toil? Our State has given life and support, not stinted, to two colleges, one medical school, three theological seminaries, and academies almost innumerable. These she has endowed in various ways, and at different times, to an aggregate extent of *one and a half million*

dollars. We envy not, but commend that munificence, and invoke the continuance of her care. But where among them all may the sons of toil obtain a knowledge of the first principles even of their calling?—that knowledge which informs labor how to be most productive with the least expenditure of means.

Let then these industrial pursuits,—the foundations of society as they are,—let them demand and receive, not as *charities*, but as RIGHTS, that the public hand should care, too, for them and their interests.

The committee, therefore, earnestly recommend the early establishment of an institution, under the patronage and control of the State, whose express object shall be instruction in *agriculture, mechanics, and in the science of teaching.*

No lack of means can forbid the measure;—there is our *immense public domain*, lying waste and unproductive,—while the permanent school fund, amounting to $107,278—the annual interest of which amounts to some $6,500,—will form, as recommended by the Board of Education, a proper basis for the department of normal schools;—altogether furnishing means abundantly adequate to establish and sustain an institution incalculable in its benefits directly to our *common schools* and to *labor*,—indirectly to every interest of society.

Many important facts, such as the selection of a site, the general organization of the school, the plan of suitable buildings, the estimated expense, &c., the committee are unable, from insufficient time and data, to present at this session. They beg leave, therefore, to recommend for the consideration of the legislature the accompanying resolve.

All of which is respectfully submitted.

PUTNAM SIMONTON, *Chairman.*

Augusta, July 20, 1849.

STATE OF MAINE.

Resolved, That a board of seven commissioners, (one from each congressional district,) be appointed by the governor, with the advice of the council, whose duty it shall be to mature a plan for an agricultural school and experimental farm, including departments for mechanics and normal schools; to prepare a detailed account of the course of studies, and plan of operations demanded; to recommend a suitable site; to estimate the probable expense of such an institution, &c., to be delivered to the governor and council on or before the to be by him submitted to the legislature at its next session.

STATE OF MAINE.

HOUSE OF REPRESENTATIVES, July 20, 1849.

ORDERED, That 1,000 copies of the foregoing Report, together with the accompanying Resolve, (reported by the joint select committee to which was referred so much of the Governor's Message as relates to Agricultural Schools,) be printed for the use of the House.

E. W. FLAGG, *Clerk*.