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☞ Address—**"Staunton Spectator," Staunton, Augusta County, Va.**

Professional Directory.

DR. B. P. REESE offers his professional services to the public. He may be found during the day at his office on the corner above the Lutheran Church. and at night at his residence on the corner of Frederick and Water streets, opposite the old market house. Calls promptly attended to in the country as well as in town. oct12-6m

S. TRAVERS PHILLIPS,
ATTORNEY AT LAW,
Staunton, Virginia,
Will practice in all the Courts of Augusta and Alleghany, and in the Circuit Courts of Rockbridge and Nelson.
Special attention given to collecting.
aug10—1y

WM. M. McALLISTER,
Attorney at Law,
Warm Springs, Virginia.
Will practice in all the Courts of the counties of Augusta and Alleghany, and as a partner with the distinguished William H. Terrill in Bath county. Prompt attention given to the collection of claims exceeding $10 each, or $20 in the aggregate. Attention given to business in any county in the State if specially employed.
july27—12m

DR. A. M. HENKEL, Staunton, Va.,
(Formerly of New Market, Va.,)
Respectfully offers his services to the public, in all the branches of the Medical Profession—special attention paid to Surgery.
May be found at his office at all hours, unless professionally engaged.
All calls promptly attended to, both day and night, in the country as well as in the town.
Office—on Bruce's corner, up stairs. Entrance on Augusta street, 3 doors from corner.
June 29 35ts

DENTISTRY.—
S. H. Henkel, D. D. S.
Respectfully informs the public that he is now located in Staunton, and is prepared to operate on the natural teeth according to the latest styles recognized by the profession. Artificial teeth inserted on Gold, Silver, or Vulcanite Plates.—All operations guaranteed to give satisfaction.
☞ Anæsthetics administered when desired.
Office on corner of Main and Augusta streets, up stairs. Entrance on Augusta street.
dec8—1y*

A. B. ARTHUR, D. D. S., (office one door from corner of Beverly and New streets,
Staunton, Va.
Artificial Teeth mounted on Gold, Silver, Platina, and Vulcanite. The greatest improvement yet introduced into Dental Seience is conceded to be the Vulcanite process; it being four times lighter than gold, and much cheaper, embracing superior cleanliness, nicer adaptation, and many other advantages. All the various operations of Dental Surgery performed with strict reference to permanency. March 20—tf

JOHN ECHOLS, Monroe conaty. | R. H. CATLETT, Lexington.
H. M. BELL, Staunton.
ECHOLS, BELL & CATLETT,
ATTORNEYS AT LAW,
Staunton, Va.,
Will practice in the State and Federal Courts at Staunton, and in the Circuit and County Courts of Rockbridge, Rockingham and Alleghany.—They will also attend to special business in any part of Va. and West Virginia. [Sept 12—tf

Hotels.

VIRGINIA HOTEL.
STAUNTON, VA.

WM. FRAZIER, late acting partner Rockbr. Alum Springs. | Capt. WM. H. SALE, late general Supt. Rockbr. Alum Springs.

The undersigned have taken a lease of the
Virginia Hotel,
and propose to open it in their partnership name
ON THE FIRST OF OCTOBER, 1869.
Their aim will be so to keep the Hotel as to attract the public patronage and make it the favorite resting-place of all visitors to Staunton.
Its location and interior arrangements will greatly contribute to this end—being quite removed from the bustle of the Depot, and the noise of shifting trains—and yet central and convenient to business. The house is *newly furnished throughout* in the very best style of modern art.
Hot, Cold and Shower Baths for ladies and gentlemen; Bar and Billiard Saloons, and Livery Stables connected with the House.
☞ The Proprietors having worked together for many years at the Rockbridge Alum Springs, to the satisfaction of the public, respectfully ask a call from any of their former friends and patrons who may visit Staunton, confidently promising them that they will find in their Hotel the comforts of a well appointed home.
They especially solicit a *home support* and therefore ask a liberal patronage at the hands of their own county people, who are not without interest in the maintenance of a first-class Hotel at their county seat. The Proprietors, if properly supported by the business men of Staunton, and the farmers of Augusta county, will be able and are determined to make their house *second to none in Virginia.*
And to this end their *charges shall be moderate.*
Omnibus to and from the depot free of charge.
All stages set down and take up passengers at this Hotel.
Mr. G. W. KENNEDY, (late of the Bollingbrook, Petersburg, Va) is in charge of the Dining Room and will be pleased to see his friends.
sep28—tf FRAZIER & SALE.

BALLARD HOTEL,
Richmond, Va., March 10.
This Elegant Establishment is open to the accommodation of the public. The building is one of the
FINEST IN THE CITY,
and for Style, Convenience and Beauty of Arrangement, is acknowledged to be superior.
ITS FURNITURE
is new and complete, and for cleanliness, it is proverbial.
The subscriber, after more than twenty years' experience in the business, thinks he risks nothing in saying that this Hotel shall, in every respect, be
EQUAL TO ANY IN THE SOUTH,
and asks the patronage of his friends and the public generally.
JOHN P. BALLARD,
march 17—tf Proprietor.

Boots and Shoes.

A. M. SIMPSON, having taking the old office of Dr. Donaghe, on Main Street, opposite Dr. Chapman's office, is prepared to Manufacture
LADIES, MISSES, AND CHILDREN'S SHOES,
of all styles and of the best quality.
Having fitted up a neat room for the accommodation of his lady friends, he will be pleased to have them call and leave their measures for any work they may need, promising to give satisfaction, as usual, in each and every instance.
feb25—tf

☞ The circulation of the "SPECTATOR" is about as great as the combined circulation of both the other papers published in this place, and has as many subscribers in this county alone as are contained in the whole list of either of the other papers.

Address of PROF. J. W. MALLET,

DELIVERED AT THE AUGUSTA COUNTY FAIR, WEDNESDAY, OCT. 13TH, 1869.

Gentlemen of the Agricultural Society of Augusta County:

In accepting the invitation with which I was honored a few weeks ago to address you upon this occasion, I was conscious of my inability to bring before you much of interest or value, but I felt that the invitation was one which, on several grounds, it would have ill become me to decline.

The conditions which surround us in Virginia at present are such as to render it in a very high degree desirable that all the useful arts of life, and especially agriculture, from which all the others spring, shall be fostered and advanced by every legitimate means.

The work set before the men of our day is so plainly the re-building of the ruins in the midst of which we find ourselves placed, that no difference of opinion upon this head exists, and no discussion of so simple a proposition is necessary. We all see that the results of the toil of generations that have preceded us are swept away, and that we are called upon, by more than the usual incentives that stimulate the exertions of men, to labor for the speedy restoration of material comfort and prosperity amongst us. It may safely be said of Southern men that they are *willing* to go to work, and that they manifest an increasingly strong disposition to do so, not singly and selfishly, but with such mutual aid and encouragement as come of united public efforts. Those are none the less willing to work *together* helpfully and hopefully now who remember that they have stood shoulder to shoulder in other and yet more severe trials in the past.

Amongst such united efforts at advancement in material prosperity there seem to be few better calculated to do good than the annual meetings of societies like yours, bringing together the people of large districts of the State in pleasant social gathering, affording opportunity for full discussion of questions of industrial interests, and displaying the actual results of improved agricultural practice and the novelties of mechanical ingenuity.

It is the duty of every member of the community to aid on such an occasion in any way he can—best by far in the exhibition of some visible success achieved with the plough or the hammer; but if not so, then even in the inferior capacity of the speaker of a few feeble words, which, so far as they go, may at least be not inappropriate.

It is not only as a member of society, however, that I feel a most lively interest in the operations of such societies as yours and a hearty readiness to assist in them by any humble means in my power. The duties of the Chair which I have the honor to hold in the noble University of the State make me particularly desirous of profiting, as a student of agricultural science, by the valuable opportunities for gaining information, both by eye and ear, which occasions like the present afford.

He whose duty it is to teach, if he would be more than a mere charlatan and pretender, must be especially solicitous to learn himself—and one can seldom during the year find himself so well situated for collecting information bearing upon agriculture, for getting at new and interesting facts, and for comparing the various opinions and experience of many intelligent men, as in the midst of an assemblage like the present.

But, yet further, I have felt that a peculiar obligation rests upon me to appear before you to-day, as affording a fitting occasion for the acknowledgement of a debt of thanks which the State University and the State itself owes to the liberality and public spirit of a former citizen of your county.

The professorship of Chemistry, in its special applications to agriculture and the other useful arts, is one the probable utility of which had long been recognized, but which could only be established in a really efficient form by the expenditure of large sums for buildings, apparatus, and material, so as not merely to provide for the performance of chemical operations by the teacher, but also for the practical instruction of of students working with their own hands. It is upon the bequest of the late Mr. Thomas Johnson of Augusta county that the University of Virginia has been able some two years ago to introduce the study of the scientific relations of agriculture amongst the subjects of instruction within her walls, and since then to erect a new Labaratory building of such ample size and thorough equipment as to challenge comparison with any institution of learning in America, in which the student may verify upon his own work-table the facts of nature of which he reads, and may learn to determine such facts for himself, to ascertain the constituents of a soil, analyze a specimen of manure, find out the real value of a marl, or prove the nature of a supposed metallic ore. A still larger gift to the University, intended for the promotion of agricultural science, has of late added to its means of usefulness in the same general direction; but, as I have said, the present is a peculiarly suitable occasion for acknowledging the original obligation of the State at large to your county for a service, the value of which you can correctly appreciate.

When called to the professorship in question, and in attempting to enter upon its duties, I have felt most strongly that, in order to any really rapid and steady progress in scientific agriculture, it is of the highest importance that there should be a more thorough mutual understanding and more concert of effort between scientific workers in the Laboratory and practical farmers in the field than have generally existed heretofore—that the chemist shall by all means help the farmer if he can, but that the farmer shall also be willing to help the chemist, and shall see the importance even to himself of his so doing—that both shall work together in a spirit of mutual good-will toward the attainment of such knowledge of the laws of nature as may help us in the great task of bringing forth from he earth food for tthe use of man.

It is to a few remarks upon this head that I venture to ask your attention to-day.

To almost any one who has noticed the general progress of scientific agriculture for the last thirty years it will be evident that there has been a want of such concert of thought and effort as I refer to.

Scientific writers—at least those really deserving of the name—have addressed themselves almost exclusively to scientific men—their works have been based mainly upon experiments made on a small scale, in the laboratory, or under more or less artificial conditions—their reasonings and conclusions have been expressed in language so far techinal as to repel the greater number of general readers. On the other hand, the efforts made by practical farmers have been made, in far too many instances, without an adequate knowledge of such well-ascertained laws of nature as bear upon the questions at issue, without acquaintance with the facts already ascertained by workers in the same direction, and without such a degree of accuracy and precision in the determination and statement of the means employed, and the results obtained, as can alone render useful to others the experience of those devoting themselves to such research.

Such one-sided investigations, whether by the men of science or the tillers of the soil, are greatly to be deplored.

Amongst the noblest pursuits that can engage the thought and energies of man is the discovery of the unchangeable laws of eternal nature and the manner in which we must make our work accord with their dictates if we are to draw from the stores of wealth, with which a kind Providence has surrounded us, all that we may enjoy of comfort and prosperity.

There are four principal steps in the process by which men learns to subdue the resources of the world about him to his service and enjoyment:

First—*Observation* of facts in nature.

Second—Experiment, for the discovery of further facts.

Third—*Logical deduction* of principles from the facts ascertained.

Fourth—*Application* of facts and principles when determined, to the practical wants of our daily life.

The husbandman notices the regular return of seed-time and harvest, the usual succession of the seasons, the facts that certain plants require certain climates and thrive best in certain soils, that in a new country a dense natural growth of hard-wood trees is an indication of fertile land, while thin scrubby pines furnish as distinct evidence of poverty of soil.

As regards such observations, the main requirement is that they be *accurate*—that they be recorded in such a way as to really represent the truth, not a part of the truth, but the whole truth, fully, fairly, and impartially stated. Thus, for instance, it is matter of the most common remark that the accounts given by travellers, in distant and little known countries, of what they have seen and learned vary enormously in reliability. Two men will visit a foreign land, and, although both men of intelligence, both having had fair opportunities for observation, and both free from any disposition willfully to deceive, they will make reports differing from each other almost as light from darkness. The one may be careful to examine into the sources of his informaiion and to verify his supposed facts as he accumulated them—the other may set down as facts what he has but imperfectly seen or uncertainly heard. Or, even though both reports contain but well ascertained facts, nothing but what could be proved to be true, yet the one may contain a large and fair collection of *all* the principal facts bearing upon the questions discussed, while the other contains only such unusual and exceptional facts as totally misrepresent the general condition of things. I know not what your experience here may have been, but further South there are few people who have not, within the last three or four years, heard just such conflicting accounts of the observations made in Brazil and some other countries by those who went thither at the close of the recent war; some of those who returned represented the region visited as a paradise, in which it scarcely required more than the exertion of dropping the seed to ensure the most luxuriant harvests, while others brought away the impression that the hardest toil and the greatest privations could scarcely be expected to result otherwise than in half starvation, ruined health, and shattered fortunes.

It is not so simple or so easy a matter as it at first appears to see truly, fully and without distortion what is before our eyes, and then faithfully report what we have seen, neither more nor less, to others. A farmer who has always lived in certain portions of Virginia might state as the result of his observation that red land yields good crops. Another, living in parts of Georgia or Alabama might assert that the poorest soil is that of the red lands—both statements might be locally quite correct, but if either be put in the form of a general observation that all red land is good or all bad the error of fact is manifest, and the two observers might dispute forever over their so-called facts without deriving any benefit from the arguments.

But the thoughtful man is unwilling to rest satisfied with simply thus observing what passes before his eyes in the undisturbed course of nature. He often desires to change the conditions which go to produce a certain result—to see what will happen if such and such arrangements be made by himself beforehand—to take the plant which he has always noticed growing by the water side and see whether it can be made to grow in upland soil; and, if so, whether its habit and character will be altered—to determine by experiment in the laboratory what are the substances drawn from the earth by a particular crop; and by experiment in the field whether the application of these substances artificially to poor land may not increase its fertility—to find out the several circumstances which separately seem to favor the production of any form of vegetable growth, and then, by attempting the culture of the same, under all these favorable conditions united, to try what is the best, and the largest product which can in practice be obtained.

In making such intentional changes of natural conditions—*in trying experiments*—the same accuracy, the same careful attention to what really takes place before our eyes must be observed as when we simply notice the operations of nature unassisted by the efforts of man.

And, in addition, much thought must be bestowed, much judgment must be exercised in deciding upon the precise manner in which, and extent to which, special arrangements are to be made to bring out the precise result of which we are in search.

Every experiment is a question asked of nature, and nature never returns a false answer; but we must take care, first, that we ourselves know exactly what question we want to ask; secondly, that we ask that question and no other, no more and no less, and, thirdly, that we understand that the answer returned actually is.—

Three farmers might undertake to experiment upon the effect of common salt upon the soil—one might report that the result was excellent and the improvement of the crop manifest—another exactly the reverse, that positive injury was done—and the third that no effect of any kind was produced. On sifting the matter it might be found that one had used a certain moderate quantity of the material in question, another an enormous and excessive amount, and the third so little as not perceptibly to influence the crop at all. Or it might appear on examination that the same quantity had been used by all, but upon different soils—by the first, upon land some of whose dormant constituents were rendered soluble and useful by the salt; by the second upon a soil poor in most of the necessary mineral ingredients but already containing largely of salt and susceptible of injury by further addition of it; by the third upon a soil sufficiently supplied with soluble mineral matter of all needful kinds to do perfectly well without the solvent action of the salt, yet not liable to special injury by such surplus of this material as had been brought in by the manure. Or, yet again, the experiment might have been tried upon similar land, but upon altogether different crops or in altogether different seasons.

While, therefore, we must be very careful in sifting the details of the information, we suppose ourselves to have gained from observation of what is going on in nature about us, and must be equally careful in arranging the conditions of our experiments and in stating the precise character and extent of the evidence accumulated by such experiments, we must still further exercise caution as to the logical conclusions we draw from our facts when we have got them—as to the manner in which we reason from these facts, assuming that they have been well determined.

There are many ways in which we may deceive ourselves as to what is really proved by admitted facts before us.

Thus, we may arrive at a conclusion from considering a number of separate statements taken as true, but of which some are in fact only probably or approximately true, and uncertainty of the conclusion increases astonishingly fast with the number of such doubtful assumptions, though there may be very little doubt about each of them by itself. For example, one may assert that his experience fully proves that a particular farming practice will be found profitable, making out perhaps a very clear statement of expenditure and return under all the proper heads, but assuming a little with regard to each—that the cost will be about so much—that the difference of cost to him and to other farmers cannot be more than about so much, and that about such returns may be looked for on an average of different years. A very little error under each head will often be found to lead to woful error in the general result.

Again, it is extremely common to find facts—themselves thoroughly well established—coupled together in the relation of cause and effect without any proper warrant, but simply in consequence of some, perhaps accidental, coincidence of time or place.

A sick man is visited by the Doctor who prescribes a dose of a particular medicine—the patient takes this, and soon after gets well or gets worse, as the case may be—how often do we hear the assertion that this *proves* that the patient has been cured or injured by the medicine, though perhaps the result would have been exactly the same if he had refused to take the prescription a all. In like manner it is amusing to notice the different styles in which the supposed effects of different manures are spoken of in seasons of particularly favorable or unfavorable weather. In a very favorable season pretty nearly all crops do well, farmers are in too good spirits to make very precise comparisons, and every one who has used any fertilizing material is disposed to say that, because he has made such or such an application to his land, and has obtained a fine return from his fields, therefore he has "made the good crop by the manure," and that the particular fertilizer he has used is that he is going to stick to in the future and to recommend to all his neighbors. On the other hand, in a very unfavorable year—one of excessive heat or continuous rain for instance—*no one's* crop succeeds, every one is disappointed, and there is a strong tendeney on the part of all those who have employed fertilizers to declare the materials they have severally used worthless—each farmer, whether he impute fraud to the manufacturer of whom he purchased or not, at any rate vowing that he will never again use the special material to which he attributes his ill success.

It is highly important to remember that, while a particular result following after a particular procedure *on one occasion* of itself proves but little as to there being any true connection between them, if a like coincidence happen a second time the probability that the one is caused by the other is much strengthened, and if such experience often repeated shows that the supposed cause is always or almost always followed by the same result, while in the absence of the former the latter is also absent, the mind can arrive at but one conclusion.

If a single farmer had on a single occasion strewn super-phosphate of lime upon his field and in that season made a good crop of rutabaga it would be far from proved that the proper manure with which to prepare land for this plant had been found—but when we find that the application of super-phosphate of lime after having been tried for many years and by thousands of farmers, almost always is succeeded by fine crops of field turnips, we are justified in concluding that the manure used has really been the cause of the general success, and that the exceptional cases of failure have been due to other causes—peculiar to the place or season—interfering.

But even if our experience has been extensive enough to fully satisfy us of the dependence of a certain effect upon a certain cause, we may be wrong in assuming that that cause acts *in a particular way.*

It is far from uncommon to find cause and effect connected in nature in an indirect and secondary manner, whereas most people are inclined to take for granted some very simple and direct form of relation between the two.

It appears easy to understand how many of the most important constituents of our mineral manures produce their beneficial effects upon crops when we find that these same substances—such as phosphoric acid, potash &c.,—uniformly form a large part of the mineral matter of the growing plant itself and are to be met with in the ash which the plant yields on burning off the vegetable portion. Now it is well ascertained that common salt used in moderate quantity exerts a very generally beneficial effect upon the fields to which it is applied, and improves the crops raised thereon.

Common salt itself consists solely of the two chemical substances chlorine and sodium.

With these facts alone before us, most people would be ready to say that chlorine and sodium are certainly,—like the other materials just referred to, forms of mineral food for plants, and must be found as constituents of their ashes.—Yet there is much reason for believing that this is not so—the quantity of chlorine and of sodium found in the ashes of most cultivated plants is so variable, and generally so small, that these can hardly be reckoned amongst the essential elements entering into the composition of the plants. While we are inclined, therefore, to reject this explanation of the benefit derived from manuring with common salt, careful experiments, to which attention has been drawn by Professor Liebig, seem to point out another and a true solution of the question. This eminent chemist has strongly insisted upon the fact that phosphate of lime—bone-earth—the direct utility of which you are all aware of, and which is practically insoluble in pure water, is dissolved in very perceptible amount by water containing a little common salt. I do not mean to assert this is the only way in which common salt may exert a useful action in the soil—it is enough for my present purpose to show that it is at least *one* way, and that an indirect one, by which it becomes the cause of increased fertility, but some persons may perhaps say—why trouble ourselves about the manner in which a particular effect is brought about?—Why not content ourselves with establishing the fact of such an effect being produced, and reaping the benefit derived from such knowledge?—is it not enough to know that common salt may be usefully employed as a manure, without any necessity for cudgelling our brains as to the precise way in which it acts? If, however, we contrast the two conceivable modes of action, to which reference has just been made, it will at once be seen that it is by no means unimportant for us to be aware which of these really occurs in nature. If common salt were capable of acting as direct food for plants, then its value when applied as a manure would depend upon the previous presence or absence of the same substance in the soil on which such application is to be made—but, if its action consists in rendering soluble the earth phosphates, then the questions arise as to any soil upon which its use is proposed, not only whether such soil already contains common salt or enough of it, but further whether there be also present the phosphates themselves upon which the solvent action is to be exerted—if these be not present, or not in adequate quantity, then they too should be made to enter into the composition of the manure to be employed.

Assuming that our observations and experiments are carefully and judiciously made, that the facts which they have established are clearly and accurately recorded, and the conclusions which they fairly lead to are fully and soundly thought out in the shape of general principles, there still remains the application of these facts and principles to useful practical purposes.

Here the element of economy is at once introduced—economy of time—economy of labor—economy of money. It is not sufficient to show that a particular result can be accomplished in a particular way, but it must be further examined whether this be the *only* way in which it can be achieved, and, if not, which of the several methods it is possible to adopt is the cheapest, the easiest, the quickest, and in general the most profitable. Thus, for example, it is not enough to have found out that by applying a certain quantity of certain substances to a poor piece of land it can be made to yield fine crops, and then to say contentedly, "I have tried this manure, and know it will succeed. I am going to stick to it." It should be tried whether by using other materials, other proportions, or other quanlities, still better products might not be obtained, whether at least as good results might not be secured by the use of cheaper materials, whether the land itself, and therefore its value is permanently improved or injured after the first crops have been removed, and in general whether not only a good but the best possible money return has been secured from the means at our command.

When such questions as these come to be discussed—as labor, time and all the other elements which, beside money itself, affect the cost or profit of an operation and admit of being expressed in the form of money, we have constantly to make our calculations on the basis of dollars and cents. And in these calculations, as in the more general reasoning of which we have been speaking, it is quite possible, and indeed not uncommon, for intelligent men in various ways to deceive themselves. Thus, much confusion as to the money results of farming operations is very often introduced by a failure to keep clearly distinct the expenditure which is properly involved in the working of the land itself which goes to make the crop, or to keep the farm up to its original standard of condition, from that which properly falls under the head of personal or family support and the improvement of the plantation.

Again, the extent of absolute original outlay upon any proposed operation is often dwelt upon, and such outlay declared to be extravagant and ruinous, without the comparison between this outlay and the profit which it is capable of yielding having ever been fairly examined. To say that a horse and plough cost more than a spade is true, but does not prove that it is cheaper to break up a large piece of land with the latter rather than the former. Yet men who admit the absurdity of such a statement as this will be found to argue in a very similar manner against the use of more modern and highly improved implements for agricultural operations, simply objecting to them that they are costly, when the real question to be considered is whether, notwithstanding their cost, the work done by them is on the whole done so much more cheaply than by older tools as to leave a balance of profit. The period of such outcry against the great cost of deep tillage and subterranean tile drainage will no doubt in time pass by in this country as it has already done in several of the older countries of Europe, and the real economic importance of such practice be recognized here as there. All these financial calculations to be reliable must be preceded by a correct knowledge of the natural facts and principles involved. If we go on to our reckoning of money results without this knowledge we are very apt to find ourselves involved in blunders and failure, but, on the other hand, if we neglect to duly weigh the money relations of the questions before us, we are equally likely to end with heavy loss and disappointment.

If a field were copiously manured with phosphate of ammonia, nitrate of potash, sulphate of magnesia and sulphate of lime, all purchased in a chemically pure state from a drug-store, fine crops could undoubtedly be made upon it, but the prices at which such pure materials are necessarily sold would utterly preclude the chance of any money profit or of even repaying the outlay. On the other hand, one may buy a fertilizer strongly recommended by its apparent cheapness—its low price—and find out that it is extravagantly dear, that the money spent upon it has been thrown away—if its composition be not such as to really benefit the land to which it is supplied, at any rate to an extent bearing a sensible proportion to the outlay.

This is just the point at which to recur to what was remarked at the outset, that in the efforts heretofore made for the advancement of agriculture there has been an unfortunate want of concert between men of science working in the laboratory and farmers working in the field. There has been a tendency on the part of the scientific investigator to look upon the farmer as a man ob-tinately resolved to carry out blindly the mere routine he has always been accustomed to, refusing to adopt any improvement suggested to him on the ground of general principle, and careless about knowing the reason of anything that he does or neglects to do. The farmer, in turn, is very generally disposed to regard the man of scientific research as an unpractical visionary, who in his enthusiasm for his experiments cares nothing as to whether he himself, or any of his friends, foolish enough to be guided by him, are ruined or not, and who, though one may harmlessly indulge him by listening to his fanciful notions, is the very last man in the world to take counsel with on any question of sober business life, upon the decision of which the support of one's family may depend.

There is doubtless *some* foundation of truth for both these views, but there is no natural necessity that either of them should be correct.

There are none of the results of scientific research bearing upon agriculture which cannot be perfectly understood, and practical use made of them, by any man of average intelligence, if only he be willing to devote a very moderate amount of time and attention to their study and begin that study at the right end.

Men of ordinary intelligence *do* master these subjects as matters of general interest.

There is nothing in a farmer's occupation to render him less capable than other people of being so, and certainly he has stronger motives than others to lead his attention in this direction. And there is also no reason that a man shall be totally incapable of considering questions involving money prudence because he devotes his attention mainly to science for its own sake—that he shall be so wrapped up in abstract research over crucibles and test-tubes as to have no ears for the experience of others working upon the large scale with the plough and the sickle. It is extremely unfortunate for the progress of any branch of industry that scientific research in connection with it and the actual practice of the art itself should be altogether in different hands. What would be the success in the business of a dyer, what would be his chance of keeping up with the progress of his art, and especially what prospect would he have of himself making any improvement, if he were totally ignorant of the real nature of the material employed by him or of the changes they undergo in passing through his hands? And of what value to such a manufacturer would be the scientific knowledge or advice of a man well acquainted with these materials and processes, but ignorant of their cost and of the kind of results demanded by the trade?

But there is scarcely any pursuit so injuriously affected as agriculture by such a separation of the knowledge acquired by scientific research and by routine practice of the art.

The greatest difficulty in the way of determining questions relating to agriculture consists in the very great number of conditions which are involved in every experiment. The mere fact that a field has been treated in a particular way and that a good or a bad harvest follows are by no means proof that the treatment adopted has been the cause of the result observed. The latter might have turned out exactly the same if there had been no peculiarity of practice, or at any rate the effect produced may have been greatly modified by the nature of the soil, the choice of a high or a low-lying piece of ground, the character of the season, the kind of seed used, the time and weather for harvesting, the treatment of the land in former years, and a hundred other causes. In a word, we see only the general result of all the concurring influences that have borne upon the cultivated plant in all its stages, and cannot at once separate from all the rest, the *one* condition whose effect we wish to examine.

As observed before, it is only by multiplying and re-multiplying experiments of this kind, and by extending the scale upon which they are made that it becomes possible gradually to arrive at positive conclusions, upon what future practice may be safely based. Such experiments, well devised and carefully carried out upon the large scale by hundreds of sound practical farmers scattered all over the country, working in successive and different seasons, and all imaginable variety of conditions as regards soil and weather, yet with a general understanding and agreement as to what the precise points are to be examined, and *how* they are to be examined, will serve to throw more light upon agricultural theory and practice than any amount of mere verbal discussion, or even than similar experiments made upon the small scale within the means of men of merely scientific research.—There are some questions which can be fully answered in the laboratory, such as the composition of a manure and its purity or impurity.

There are others which can be answered by experiments with growing plants in a flower-pot, or upon quite a small patch of ground.

There are others, and there of great importance, which are beyond the means of any but the practical farmers of the country.

There are still others, most important of all, which demand the united labors of the chemist and the farmer, or rather of many chemists and many farmers, working together with a clear mutual understanding of what they want to find out, how they mean to go about examining the question, and how the results are to be discussed and compared.

It is true that every year sees an immense number of experiments made by farmers, and many of them made with a good deal of pains and labor—the agricultural journals are full of reports of the results—but unfortunately a great deal of the trouble thus taken is wasted as far as any positive increase of our knowledge is concerned.

Too many experiments are undertaken without a clear understanding of what is to be determined, without proper information as to what others have already done in the same direction and what remains to be found out; without proper judgment as to the course to be pursued to get at the facts in the simplest and most certain manner, without such accuracy as to weights, measures. &c., as alone makes results reliable, and, above all, without the adoption of such a form of experiment as admits of comparison of the results with those which others have obtained. In proof that this is true I appeal to your own experience—what an amazing difference and variety of opinion do you find in any gathering of ten or twenty intelligent farmers, who meet to talk over the results of their respective experience of any new agricultural material or method—how difficult it is to sum up all that they have learned by their experience in the form of a distinct general statement. Yet this ought not to be so—the laws of nature are in themselves fixed and invariable—the truth exists, if we can only find it out—and every experiment, and still more the united experience of many persons, devoting themselves to the same pursuit, ought to teach us something, to make some addition to the stores of knowledge of those who have gone before us.

Having trespassed upon your kind attention at such length by thus urging in general terms the importance of united effort for the progress of scientific agriculture, I will but sum up the two or three practical suggestions which seem most readily to grow out of the subject as it has been discussed.

In the first place, it appears clearly desirable that farmers and those who are to become such, should recognize as a part of the training which is to render them fit not only for successfully practising the art they have chosen as their pursuit for life, but also contributing to the improvement of that art, the study—up to a certain point at least—of the facts and laws of nature, which alone are capable of throwing intelligent light upon their pursuit.

It is hard to understand why the young man who is to devote himself to agriculture shall form the exception to the general rule that some some training in the broad principles upon any profession or avocation depends should precede the actual practice of such avocation itself. If a man proposes to make his son a lawyer, he does not turn him loose in a court-room to attempt at once the pleading of cases, there must first be much hard study of treatises upon the general theory of law.

If a lad is to become a physician he must go to work upon his anatomy and physiology, and aim at acquiring a general knowledge of the structure and laws of the human frame It would be almost as unfortunate for himself as for his patients if without any such preparation he were to be brought to the bedside of the sick and allowed to treat disease by mere blind experience. Even if he should see the practice of others better educated than himself, he would be incapable of really understanding it, or of imitating it when any novel complication of symptoms presented themselves.

In like manner, if a man is to be an engineer, an architect, a miner, or a successful manufacturer, he must study the work before him ere he begins practically to engage in it.

But it is too commonly the case that a young man "goes upon the farm" with no special education whatever tending to fit him for the intelligent practice of agriculture—he knows nothing clearly of the composition, the air, the water, the soil and the manure which are the materials out of which he is to make his crops; he knows scarcely anything of the manner in which those crops grow, or of the wonderful and beautiful laws of vegetable development—he is equally ignorant of the principles that govern the life of the animals he is to raise and to use. All that he can do is to notice the practice of others, and to imitate it as closely as possible, not knowing the true reasons for what he thus learns as a matter of routine, nor knowing any good reason for trying one thing rather than another, if he wish to make any effort at improvement. Such a man is not only incapable of originating of any improved methods himself, or of meeting any novel difficulties that come in his way, but he is even incapable of usefully receiving from others the assistance which is yielded by the progress of scientific research.

It is useless to try to explain any particular question to one who is ignorant of the whole subject in its scientific aspect—to whom carbonic acid, ammonia, phosphoric acid, &c., are simply hard words with no distinct idea attached to them, instead of standing for real *things* that he has seen and smelled and tasted and examined, and which he knows exist all around him, silently building up before his eyes the wheat and corn and cotton and tobacco, the production of which is his business in life.

Please observe carefully that I am not at all advocating the idea that scientific study alone will ever make a successful farmer, or that such study should even form a very large part of his training. Farming is an art, and, as in the case of every other art, there is no way to acquire it but by a regular practical apprenticeship in the field. If the homely old saying be true,

> "He that by the plough would thrive
> Himself must either hold or drive,"

it is especially true in the beginning. The young farmer must undoubtedly learn how with his own hands both to hold and drive the plough, and how all other practical details of the art are to be carried on. But the acquirement of this practical knowledge will not be in the least interfered with by his having previously learned something of the principles upon which he is to work.

Sir Humphrey Davy put this point very clearly in the following passage from the first of his lectures in England on agricultural chemistry, now more than fifty years ago: "It has been said, and undoubtedly with great truth, that a philosophical chemist would probably make a very unprofitable business of farming; and this would certainly be the case if he were a mere philosophical chemist, and unless he had served his apprenticeship to the practice of the art as well as to the theory. But there is reason to believe that he would be a more successful agriculturist than a person equally uninitiated in farming, but ignorant of chemistry altogether; his science, as far as it went, would be useful to him." In other words, the question is not, whether a man who has studied solely in a laboratory or one who has derived all his knowledge from simple work in fields is likely to be the better farmer, but whether he will not far excel them both who has added to a careful study of the broad and simple principles of natural science an equally thorough mastery in detail of the methods by which these principles are applied to farming practice.

Surely the man who is to spend his life in the cultivation of the soil may well bestow a few months in learning what, when he *has* become a farmer, will often prove to him a steady light, helping him to surmount present difficulties, and pointing out to him the direction for future improvements. But, as on the one hand it would be well that farmers should more generally aim at acquiring for themselves some insight into scientific truths, so on the other it is greatly to be desired that the number of chemists and other scientific laborers, devoting their attention to agriculture, should be increased.

For reasons to which I have alluded, the solution of agricultural questions demands the combined efforts of a very large number of persons both in the field and in the laboratory—the amount of work required is beyond the powers of any one or any few of those devoting themselves to such research.

In Europe, especially in Germany and France, government means are liberally applied to the maintenance of laboratories for agricultural research, and a large number of thoroughly trained chemists are constantly at work.

As an evidence that here at home we are not altogether without movement in the same direction, it gives me much pleasure to be permitted to mention one step lately resolved upon by the Board of Visitors of the University of Virginia.

In arranging for the extension of instruction rendered possible by the gift of the late Mr. Samuel Miller, of Lynchburg, for the support of a department of agricultural science, it has been decided to establish two scholarships, each of five hundred dollars a year and tenable for two years, one to be competed for annually at a special examination of candidates voluntarily presenting themselves, such candidates to have previously completed the regular course of instruction in the school of agricultural and industrial chemistry—those who are successful to engage in further study and in the prosecution of useful scientific research under the direction of the Professor of this school for the period of the scholarship. These are the main features of the plan, though the details may be modified. By this plan it is hoped that the University may become the means of supplying to the State a number of thoroughly-trained, practical chemists, who, during the proposed period of advanced study, will have had an adequate and assured support, as well as great advantages for the prosecution of their labors, and will have accomplished much useful public work in the shape of analyses and investigations of matters connected with agriculture. Lastly, I would suggest that just such societies as that I have the honor of addressing, and just such occasions as the present might be made additionally useful by the proposal of district agricultural questions for thoro' examination by the combined efforts of farmers and scientific men—not too many questions being taken up at one time, but these to be, if possible, worked out to definite conclusions.

Thus at each annual meeting a joint committee might be raised, consisting partly of practical farmers and partly of agricultural chemists, such committee to carefully prepare for the meeting of the following year a report in which should be set forth one or two questions, clearly stated, and of practical interest and importance—such as, for example—what proportion ought the ammoniacal components (Peruvian guano, &c.) in a mixed fertilizer to bear to the phosphates for the culture of wheat on the more important soils of the Valley of Virginia? is there any advantage in using potash in the form of sulphate rather than muriate upon tobacco, or the reverse?—up to what limit as to quantity may plaster be used upon clover land with profit? and so forth.

Each question proposed should be accompanied with a statement of the method proposed for examining it—a programme to be carried out by all those willing to assist in the experiment—giving the exact mode of experimenting in detail and the heads under which returns of the facts obtained are wanted. Here are some printed programmes of this kind, referring to experiments on tobacco manures which some gentlemen have been kind enough to undertake for me during the present year—unfortunately a most unfavorable one for the purpose, owing to the drought—these may serve to illustrate such forms as might be used.

Then there should be an understanding as to the names and addresses of those farmers who are willing to promise their active co-operation in carrying out the field-work of such experiments as might be determined on, and in like manner of those chemists who agree to make any analysis necessary to fully work out the question or questions. Such services ought to be, and doubtless would be, rendered freely and without cost, but in cases involving expense for materials, fertilizers, seeds, &c, some assistance in meeting such expenses would seem to be no unsuitable or useless mode of employing the funds of the society.

Finally, a report to the society at a subsequent meeting upon any question thus carefully examined, giving the conclusions arrived at and the experimental facts upon which these conclusions had been based would reflect credit upon the intelligent activity of the Society, and would constitute a real addition to our stores of knowledge in relation to scientific agriculture.

Whether in this way or in the many other directions of effort which present themselves, let us trust that the substantial usefulness of Societies like that to-day assembled may constantly increase—that their growing energy may ever tend to throw fresh light upon the interesting scientific questions which connect themselves with farming; may serve more and more to improve the practice of that oldest and noblest of the arts; may exert a marked influence for good upon the material prosperity of the country, and may continue year after year to bring together on these genial anniversaries large and larger gatherings of men from this side and from beyond the mountains united by the ties of a common occupation, common interests, and hearts bound up together in common regard for the future destiny of this grand old State.

A Partisan Pro Consul

General Reynolds, the military autocrat in Texas, writes to the President all about party matters in Texas; and the President authorizes a publication of his letter in the Washington *Chronicle!* Reynolds objects to the election of Gen. Hamilton, a good Republican, on a Republican platform, because he is supported by so-called Democrats, who have no candidate of their own! As a consequence, all the Government patronage, and all the military power in the hands of this unscrupulous tyrant, are to be used against the man for whom Democrats vote in the choice they make of evils. If Gen. Davis, the Radical candidate, is worse than Jack Hamilton, the Lord deliver the people of Texas from Davis and Reynolds. But what a pass, meanwhile, the Government brings itself to by engaging in such a squabble!—*Lynch. Virginian.*

CAUSES OF INTEMPERANCE.—The Probe, a newspaper published at the Sanitarium, near Media, Pennsylvania, states that one-third of the whole number of patients in the institution acquired a taste for strong drink in attending parties and other social gatherings; that the other two-thirds became drunkards from constitutional tendencies, inducing insanity in some and reckless disregard of moral obligations in others. Of the first class, twenty-two were cured; of the second, only eight. Two thirds of the whole had the benefits of Christian and temperance training, while only twenty-three had been neglected.

Concession thus far has provoked new demands, each ultimatum has been succeeded by a new exaction, and when we have surrendered the last remnant of self-respect we will still find that Congress stands ready with new requirements, and that the concessions made to Grant are not satisfactory to the fierce Radicals who hold our political destinies in the hollow of their hands.

Look before you leap is a wise maxim, and we commend it to the careful consideration of our friends in the next General Assembly.—*Norfolk Virginian.*

There is a difference between happiness and wisdom—he that thinks himself the happiest man, really is so; but he that thinks himself the wisest man, is most generally found to be the biggest fool.

Charles Read says: "The fortunate man is he who, born poor, or nobody, works gradually up to wealth and consideration, and having got them, dies before he finds they are not worth so much trouble."