INTERNAL REVENUE

Operations of the Service Shown in the Annual Report.

Receipts for the Fiscal Year Estimated at \$150,000,000.

The annual report of John W. Mason, Commissioner of Internal Revenue, which has just been submitted to the Secretary of the Treasury, contains a mass of in terest ing information in regard to the operations of that service. The total receipts for the last fiscal year from all sources were \$146,035,416, an increase of \$3,440,719 over the receipts for the previous of \$3,440,719 over the receipts for the previous fiscal year. The cost of collection for the past fiscal year was \$4,210,604, or 2.88 per cent. of the receipts. The cost for the previous year was 2.82 per cent. of the collections. The estimated expenses for the next fiscal year are \$4,522,580.

During the year 608 ctills were destroyed.

During the year 698 stills were destroyed and ninety-seven were removed, involving

the arrest of 378 persons.

The aggregate amount of taxes collected The aggregate amount of taxes collected from tobacco during the last fiscal year was \$32,796,270. The decrease of collections for the last fiscal year as compared with those for the previous fiscal year was \$1,162,720. This is due to the reduction, by the act of October 1, 1890, of the tax on snuff, chewing and smoking tobacco January 1, 1891, from eight to six cents per pound, and to the repeal of special taxes relating to tobacco May 1, 1891. The increase of taxed tobacco and snuff over the fiscal year 1890 was 15,650,884 pounds; the increase of taxed was 15,650,884 pounds; the increase of taxed cigars was 387,002,784, and the decrease of cigars imported and withdrawn for consumption was 29,740,729. The increase of taxed cigarettes was 451,284,080, and of cigarettes

exported was 35,224,200.

The total number of grain, molasses and fruit distilleries registered and operated during the year is 4049 and 3819 respectively, a decrease of 2381 in the number registered and a decrease of 2392 in the number operated. exported was 35,224,200.

The quantity of spirits, 115,962,389 gallons, produced and deposited in distillery warehouses during the fiscal year ended June 30, 1891, is more than the production of the year 1890 by 6,686,461 gallons.

The quantity of spirits in distillery warehouses June 30, 1891, is the highest quantity so held at the close of any fiscal year.

The quantity of distilled spirits in the United States, except what may be in customs bonded warehouses on the 1st day of toms bonded warehouses on the 1st day of October, 1891, was 152, 945, 773 gallons.

commissioner announces h's purpose of substituting weighing for gaugin; in ascertaining the quantity of distillar spirits subject to tax. He has contracted at the expense of the United States for 2300 scales of weighing beams, with poises and barrel

Tables in regard to the production of oleomargarine show an increase from year to year in the production both for consump-tion at home and abroad. The total production of eleomargarine during the past year was 44.392,409 pounds, being the largest in the history of eleomargarine operations.

In a chapter on sugar the commissioner details the action of the bureau in providing for the reavment of bounty as authorized by

details the action of the bureau in providing for the payment of bounty as authorized by the Tariff act. The number of sugar pro-ducers who have applied for license is 4906 and their estimated production is 613,376,380 pounds, of which 572,403,380 pounds is cane

on this subject the commissioner says:

"The above estimate of production was made by producers early in the season, and is considerably in excess of what may be expected. In making their estimates for the year the sproducers naturally placed their figures high. It is what they hoped to make if all conditions were favorable." He estimates the bounty to be paid on cane sugar. make if all conditions were all on cane sugar, timates the bounty to be paid on cane sugar, \$8,912,500; on beet sugar, \$500,000; on sorghum sugar, \$40,000; on maple sugar, \$176,250;

total, \$9,628,730.

The commissioner estimates that the receipts from all sources for the current fiscal year will aggregate \$150,000,000.

PALU ALTO IS KING.

Senator Stanford's Great Stallion Trots a Mile in 2:08 3-4

Palo Alto, United States Senator Stanford's peerless stallion, is king of the trotting turf. A few days ago this greatest son of the world's greatest trotting sire, Electioneer, trotted a mile at Stockton, Cal., in 2:08%, equaling the record of the queen of trotters, Mand S., and going dangerously near to that of his recent stable companion,

The great stallion made his mile without king of drivers, handled the ribbons over him, and was greatly elated when the horse passed under the wire in time surpassed only by one horse and equalled only by another. The track had been in preparation for the trial for some time, and when Palo Alto went to the wire it was almost in perfect shape.
The time by quarters was: 0:31%, 1:03%,

The price of broomcorn has advanced during the past six weeks from \$70 to \$150 a ton. The United States uses 35,000 tons of broomcorn annually, and there is now only 27,000 tons in the country.

THE MARKETS.

THE MARKETS.					
47	NEW YOR	K.			
Beeves			00	@ 5	
Milch Cows	com. to good	20	00	@45	
Calves, con	amon to prime	2	00	@ 8	50
Sheep		3	50	@ 4	
			3734		25
Hogs-Live		4	00	@ 4	30
	ssed		434		6%
	y Mill Extra		-	@ .	
	tents	* * * *	35	@	
	o, 2 Red		0534		
Rye-State		1	0.755.755.00	00 1	92
Barley-Tv	wo-rowed State		56	@	70
Corn-Ung	graded Mixed	***		0	42
Uats-No.	1 White ed Western	****	87	a	40
			70	ä	75
	d to Choice		60	ä	70
Burnw-LX	ong Rye	••••			06,10
Datter St	tate Creamery	••••	22	a	281
	airy, fair to go		19	a	253
w	est. Im. Crean	ery	15	ä	25
	actory		14	a	17
	tate Factory		81	400	11
S	kims-Light		2	a	3
VI VI	Vestern			40	9
Eggs_Sta	teand Penn		27	0	28
	BUFFAL				
Steen-W	estern		8 40	0	3 85
Sheer- M	edium to Good		4 00		4 25
Jueop- M	his to Good			a	5 50

BOSTON.

WATERTOWN (MASS.) CATTLE MARKET. ef-Dressed weight..... 4 @ Sheep-Live weight..... 43600

Corn—Dec.
Onts—Ungraded White....
Potators—Early Rose Penn.
Butter—Creamery Extra...
Cheese—Part skims..... tance of more than two or three miles.

OUR MILITARY SERVICE.

The Secretary of War Makes Public His Annual Report.

The Problem of Coast Defenses Practically Settled.

The annual report of the Secretary of War has been made public at Washington. It reviews the entire status of each branch of the army service, together with the subject of coast defenses, pensions, promotions, war records, national cemeteries and sol-

diers' homes.

diers' homes.

Hegarding the subject of coast defense Secretary Proctor reviews the work of the board of army officers and civilians provided for by Congress in 1885, and also the results of the consideration of the same subject by both houses of Congress. "This policy," says the Secretary, "necessarily contemplates a system of land policy," says the Secretary, "necessarily contemplates a system of land defenses as its most important feature. We have some 4000 miles of seacoast, exclusive of Alaska. No great naval power has more than a few hundred miles of coast to defend, and yet even they protect their harbors with heavy fortifications and high-power guns. The cost of land defenses has not increased as rapidly as the cost of the means of attacking them. They are not only the cheapest to build, but once built the cost of maintaining them can be reduced to the minimum. Neither are they an experiment, nor can they become useless, but they may be built with a view to further strengthening if required, and capable of mounting larger guns if necessary."

The Secretary points out that over half the entire appropriation has been allotted and about \$350,000 expended. He therefore recommends that an appropriation of \$500,000 be continued annually until all the nec-

essary sites are secured.

Desertions from the army have been less than in any other year of its history. From January 1st, 1867, to June 30th, 1891, twentyfour and one-half years, the number of de-sertions from the army was 88,475. It has

cost the Government a very large sum for pay, clothing, subsistence, and transportation of recruits to replace these men.

For the year ending June 30, 1889, the rate was 11.6 per cent.; for the year ending June 30, 1899, the payer ending the year ending June 30, 1899, the payer cent. was 11.6 per cent.; for the year ending June 30, 1890, nine per cent.; for the year ending June 30, 1891, 6.1 per cent. During the twelve months ending September 30, 1891, the rate was only 5.8 per cent., and for a like period ending October 31, 5.7 per cent.

It is recommended that the age limit for original enlistments in the army be reduced by offering greater inducements to young men. This should be done by a reasonable increase in the pay of non-commissioned

increase in the pay of non-commissioned officers, especially that of First Sergeents, and by giving them a better opportuniny to compete upon examination for commissions. The Secretary renews his suggestion that the provision of the statute making the recom-

provision of the statute making the recommendation of the company commander a condition percedent to promotion from the ranks to a Lieutenancy be repealed.

The adoption of the three-battalion system is urged on the ground that, under the new tactics required by the increase in range and rapidity of fire, a ten-company battalion cannot be manouvred.

Nothing unfavorable has been brought to the attention of the department regarding the utility as military organizations of the Indian companies of either arm, but so far there is no reason to believe that much more than was expected of the experiment will be realized. will be realized.

Twenty-eight army posts have been abandoned since June 1, 1859, and the number of post traders has been reduced from eighty-five to twenty-two since March 4,

The number of cases received by the Record and Pension Division of the department in the course of the last year was 158,259 in excess of the previous year, being an increase in business of fifty-two per cent. The work of transcribing the original records is going on rapidly, and the work can be completed within a year and a half, when the depart. on rapidly, and the within a year and a half, when the department can dispense with the services of 600 of its present clerks, at a saving to the Government of at least \$1,000,000 yearly. The work of collecting the Civil War seconds is also

progressing rapidly.

The most gratifying results have attended The most gratifying results have attended the new system of examinations for promotion. It is urged that the exception regarding the promotion of First Lieutenants in commission be repealed, and the law made to apply uniformly to all. It is also urged that the department have at its immediate disposal correct information relative to the capacity, habits and professional attainments of each officer in the army.

There is no inducement for the maintepance of a greater number of militia than is

There is no inducement of this mance of a greater number of militia than is actually required by the law, but rather the reverse, if economy be consulted. The allotment as now made is not based upon the appropriawhat States do in return for the appropriation, but what they ought to do.

The report concludes with a memorandum of expenditures, appropriations and estimates. The expenditures for the fiscal year ending June 30, 1891, were \$51,450,764.68, of which \$2,150,646.53 were for salaries 68, of which \$2,150.646.53 were for salaries and contingent expenses, \$25,344,199.73 for the support of the army and Military Academy, \$16,061,478.96 for public works, including river and harbor improvements, and \$7,894,439.46 for miscellaneous objects. The estimates for the fiscal year ending June 30, 1893, include \$2,085,178 salaries and contingent expenses, \$26, 209,170.77 for the support of the army and Military Academy, \$13,208,333 for public works, and \$4,381,861.60 for miscellaneous objects, making a total of \$45,975,603.37.

POPULAR SCIENCE.

A well of electricity has been discov-

ered near Red Wing, Minn. A man thirty years of age may expect

to live for another thirty-two years. The use of gas for illuminating libraries is found to destroy the leather bind.

ings of books. A trunk line of fifty telephone wires, between New York and Chicago, will

soon be completed. Leprosy's microbe, recently discovered, is of infinitesimal size, and is re-

markable for its activity. Professor Keeler, of the Allegheny (Penn.) Observatory, says that the sun will continue for 8,000,000 or 10,000,-000 years to illumine and warm the earth.

A French scientist has perfected a device for obtaining oxygen from sea water by electric means, and carrying it to any part of a vessel to use as a disinfectant.

A mixture of powdered aluminium and chloride of potash will give a brilliant flash light. It gives no smoke, and is thus far better than magnesium for photographic purposes.

Recent experiments upon the electrotype generation of pressures from gases formed in a closed space have been very successful, and a pressure of 1200 atmospheres has been obtained.

A French bee-keeper has experimented with his bees as carriers of dispatches. One difficulty of the bee service is that the insects will not return over a dis-

SABBATH SCHOOL.

INTERNATIONAL LESSON FOR NOVEMBER 29.

Lesson Text: "Christ Before Pilate," John xix., 1-16-Golden Text: Romans iv., 25.

1. "Then Pilate therefore took Jesus and scourged Him." Before the high priest He was accused by many false witnesses, and by the council condemned to die, because He said He was the Christ, the Son of God; then they mocked Him, smote Him, blindfolded Him, spat in Hisface, and when the morning was come they bound Him and led Him away to Pontius Pilate, the Roman governor. It was while He was before the high priest that Peter thrice denied Him. Pilate finding no fault in Him (xviii., 38) desired to release of Barabbas, a robber and murderer. How like those who now prefer the devil, a murderer from the beginning, to Jesus, the murderer from the beginning, to Jesus, the Prince of Life.

Prince of Life.

2. "And the soldiers platted a crown of thorns and put it on His head, and they put on Him a purple robe." In the scourging we see Him receiving the stripes by which we are healed; He who did no sin suffers in the sinner's stead, for the Lord laid on Him the iniquity of us all (Isa. liii., £, 6). In the crown of thorns we see Him bearing the curse upon the ground (Gen. iii., 18), for His redemption when fully consummated shall bring deliverance to the very earth itself, and there shall be no more curse (Rev. xxii., bring deliverance to the very earth itself, and there shall be no more curse (Rev. xxii., 3; Rom. viii., 21). The purple robe was their mockery of His royalty, but His real royalty shall yet be seen, as it is written, "Yet have I set My King upon My holy hill of Zion" (Ps. ii., 6). See also Jer. xxiii, 5-8. 3. "And said, Hail, King of the Jews! and they smote Him with their hands." When the Jews rejected Him as their king and

the Jews rejected Him as their king and mocked Him, we need not wonder at these Roman soldiers and their words and conduct. The lesson for to-day is that if Christians think as little of Christ as they seem

to, what wonder that the world goes on its way thinking still less of Him.

4. "Pilate therefore went forth again and saith unto them, Behold, 1 bring Him forth to you, that ye may know that I find no fault in Him."

fault in Him."

5. "Then came Jesus forth, wearing the crown of thorns, and the purple robe. And Pilate saith unto them, Behold the man."

Concerning the first king over Israel we are told that when Samuel saw Saul the Lord said unto him, "Behold the man" (I Sam. ix., 17). Saul, however, was a great contrast to Him of whom it is written in Zech. vi., 12, 13, "Behold the man whose name is the Branch. * * * He shall build the temple of the Lord, and He shall bear tha glory, and shall sit and rule upon His

glory, and shall sit and rule upon His throne." (Zech. xil., 10).

6. "When the chief priests therefore and officers are Him. officers saw Him, they cried out, saying, Crucify Him, crucify Him." Like wild beasts thirsting for blood they seek His life. How they hated Him! It is but faintly shadowed forth in the hatred of Joseph's beather.

"The Jews answered Him, We have a law, and by our law He ought to die, because He made Himself the Son of God." Their accusations were that He said God was His Father, making Himself equal with God, and that He, being a man, made Himself God (chapter v., 15; x., 33). His works had clearly proved that He was what He said He was, for who but God could cleanse the leper, open the eyes of one born blind and raise the

When Pilate therefore heard that says. "When Filate therefore heard that saying he was the more afraid."
9. "And went again into the judgment
hall and saith unto Jesus, Whence art Thou?
But Jesus gave him no answer." Jesus knew
when to speak, and just what to say, and
when to be silent. If we are true believers
Christ is in us; why, then, should we not
know just when to speak and when to be

10. "Then saith Pilate unto Him, Speak-est Thou not unto me? Knowest Thou not that I have power to crucify Thee, and have power to release Thee?" So it seemed to Pilate, but he like other rulers of whom we read in Scripture knew not that "The Most High ruleth in the kingdom of men, and giveth it to whomsoever He will, and setteth giveth it to whomsoever He will, and setted up over it the basest of men" (Dan. iv., 17). Jesus Himself was the very one who as God had given this position to Pilate for the time being, but Pilate knew it not. He only saw before him a helpless man whose life was being sought by an angry people, and whom, as he though, he had power to release or

crucify.

11. "Jesus answered, Thou couldst have no power at all against Me, except it were given thee from above; therefore he that device the state of the property in." given thee from above; therefore he that de-livered Me unto thee hath the greater sin." Even the devil could not lay a finger on Job, the servant of God, without God's per-mission (Job i., 12; ii., 6). How much less could Pilate touch the Son of God without permission from God. But permission from God does not lessen the guilt of the sinner, therefore the High Priest of Israel, who delivered Jesus to Pilate, was more guilty than

Pilate.
12. "And from thenceforth Pilate sought to release Him; but the Jews cried out, saying. If thou let this man go thou art not Cmsar's friend; whosoever maketh himself king speaketh against Cæsar." Pilate knew Him to be innocent and testified to that fact; he had just acknowledged to Jesus that he had power to release Him; the knew that that was the right thing to do, and yet he hesitates to do it. We cannot say a good word in favor of his fear to do right. Then see these hypocritical Jews standing to Casar against their own King, the Lord

from Heaven.
13. When Pilate therefore heard that saying he brought Jesus forth and sat down in the judgment seat, in a place that is called the Pavement, but, in the Hebrew. Gabbatha." Pilate decides to continue Casar's batha." Pilate decides to continue casual friend at all costs, however much he would like to be a friend of Jesus, and he sits on the judgment seat as Cæsar's represente

14. "And it was the preparation of the passover and about the sixth hour, and he sayeth unto the Jews, Behold your king!" In verse 5 it was "Behold the man?" Son of Man, Son of God, King of the Jews, it is all true. It shall be seen now ere long, and the passover shall have its complete fulfilment in the kingdom of God (Luke xxii., 15, when He shall come no longer in here.

ment in the kingdom of God (Luke xxii., 1a, 16), when He shall come, no longer in humiliation riding upon an ass's coltdohn xik, 14, 15), but upon the white horse of power and victory, accompanied by all the armies of heaven (Rev. xix., 11-16).

15. "But they cried out, Away with Him! Away with Him! Crucify Him! Pilate saith unto them, Shall I crucify your king? The chief priest answered, We have no king but Caesar." Contrast Ps. lxxxix., 18, "The Lord is our defense, and the Holy One of

The chief priest answered, we have the but Cæsar." Contrast Ps. ixxxix., 18, "The Lord is our defense, and the Holy One of Israel is our King." But as it was in Samuel's days, when they rejected God as their king (I Sam. viii., 7), so now they rejected God manifest in the flesh, the Son of David, Son of Abraham, Son of Man, Son of God, and they have been reaping the fruits of their choice from that day to this.

16. "Then delivered he Him therefore unto them to be crucified. And they took Jesua and led Him away." The voices of the chie' priests prevailed, a robber and murderer was set free, and the Jews chose Cæsar instead of God. Pilate also decided against Jesus in favor of Cæsar. And to this day our Lord is still rejected and by the world disowned, by the many still neglected, and by the few enthroned. He is ever before us for reception or rejection, and many times a day we must decide for Him or against Him. Let us always say: "We have no king but Jesus."—Lesson Helper.

An untutored foreigner stripped off his raiment and went swimming in Boston's famous "frog pond" the other afternoon. This affords Mr. Howells the best possible theme for another realistic novel.

THE FARM AND GARDEN.

SPECIAL FARMING.

There has been some controversy in regard to the comparative merits of special farming and diversified farming, with a general opinion that special farming was the most profitable. Undoubtedly it is so in many cases, where the farmer has a special liking for some one branch of his business and an adaptation to it, and is in a locality or upon a soil peculiarly fitted for it. He gives his whole attention and energy to it, and liking it well enough to strive to do the best thing in the best manner, he could scarcely help achieving success. Yet every successful one has had a host of imitators, who have failed to attain anything beyond mediocrity, and financially have not obtained good results. They either are not adapted to special farming, or have not found the right specialty yet, and a specialty in farming, as in anything else, requires patience, perseverance and courage to stick to it despite discouraging failures, and to wait until by many errors the right methods have been found. Again, there must be behind all this a capital to carry him through the unfavorable seasons and the losses which seem to come at some time in any kind of business .- New Orleans New Delta.

LIME WITH THE ARSENITES. Use of the arsenites-London-purple and Paris-green-to protect apples is becoming very common, says Professor A. J. Cook. That we may thus save plums, if the fruit be abundant and the curculio not very numerous, is probably true, and thus these poisons are going to to be used more and more. As is well known, these substances often injure the foliage not a little. If plant-lice or drouth take from the strength and vigor of the trees then very likely they will suffer more surely than when in full vigor. Then we should strive to remove the chance of danger. We should never use these poisons stronger than one pound to 200 gallons of water; that strength is always sufficient to accomplish the purpose. If weaker than this we do not always reap full benefit. Last year Professor Gillette found that by the use of lime with these substances the soluble arsenic was changed into an invaluable compound, and then the foliage was not injured. The same has been proved true at the Michigan station. We experimented on all our fruit trees, even the tender peach, and the lime in every case prevented all injury. We tried several applications at intervals of ten days on some plants, and no harm resulted. see then that by use of Bordeaux mixture or limewater, instead of pure water, we can entirely prevent injury to foliage by the arsenites. The limewater should be formed by putting from one pound to four pound of thoroughly slaked lime into 100 gallons of water. If we wish to use an insecticide and a fungicide at the same time, then we may add one pound London-purple to 100 gallons of Bordeaux mixture. In every case the lime must be carefully and thoroughly soaked, or that will kill the foliage .-New York Tribune.

FEEDING BEES.

frost has put in its appearance. After- Suffice it to say that the time will soon swarms, possessing valuable young come when we shall no more think of queens, may not have sufficient stores to fermenting manure without "yeast" than last them until it can be gathered from of fermenting beer or bread without the fields. It is a pity to let them starve, yeast. We should make the yeast on for they may be valuable another season our own farm. In fact it will make itand able to pay both principal and inter- self; but we should encourage its growth est for what is now loaned them. Honey and preservation, and use it. freely and is the natural food for bees, but when effectively. We should make ammonia there is a failure in this commodity we and nitrate at home precisely in the same must find a substitute. Get the best way as it is made in the rainless regions granulated sugar (an inferior article will of Chili. We should have nitrate beds not do, as it is not safe for winter food) on our own farms and in our own garand sift twenty pounds of it into a pan dens. It may be said that there is not containing a gallon of water. If liquid nitrogen enough in a ton of manure to hopey can be obtained add five or six pay for the labor of piling and fermentpounds, stirring it together; the honey ing it. In that case we can buy some prevents granulation. If honey is not to fish scrap or tankage that furnishes insobe had add just enough tartaric acid or luble nitrogen at a cheap rate, and spread vinegar to make it a little tart in order it, with the nitrate yeast, on the layers to prevent granulation. This will be of manure as we make the pile. But we appropriated by the bees if given to must not forget the yeast, and it may them slightly warm. There are many bee-feeders for sale by the trade, but any earthen household vessel can be used for the purpose if one is careful. A vessel ot glass or earthenware of sirup for the -American Agriculturist. bees must be filled with cut straw, shavings, or chips. I have used little pans, by tying over them cheese cloth locsely, so that it would settle down as they took out the sirup, and could not get under it. Wooden butter dishes which do not leak, make good feeders, as the bees can not hold onto wood and not drown. The Dadants use tin fruit cans by tying muslin over the top, and inverting them on a plate. The sirup is held by atmospteric pressure, and can be placed above the bees, when they will take it through the muslin. Bees must be fed inside the hive, in such a way that none from the outside can gain access to it; in two-story hives this can readily be done. It is betfer to give twenty-five pounds of feed now, than to disturb them by feeding in spring. They do not breed up strong in spring when they know that their stores are getting low. If they starve before flowers bloom, all the feed given to them

will be lost. A number of small colonies better be united than left to starve and freeze. Take away all queens but one, and set in the combs alternately, no two from the same hive together. The combs containing honey could be uncapped and put in the upper story, with a little place for the bees to come up, when they will carry it below .- Orange Judd Farmer.

HOW TO DOUBLE THE VALUE OF MANURE. The chemists of some of our experiment stations have adopted the following trade values of the ingredients of fertilizers for the present year: Nitrogen, per pound in hair, horn shavings, and coarse fish scrap, seven cents; in ammonia salts, eighteen and a half cents. Phoswater, two cents; soluble in water, eight cents.

Nitrogen is nitrogen, and phosphoric acid is phosphoric acid, but there is a great difference in their trade and manurial value according to their availability. A pound of insoluble nitrogen in coarse fish scrap is worth only seven cents, while a pound of soluble nitrogen is worth eighteen and a half cents. A pound of insoluble phosphoric acid is worth only two cents, while a pound of soluble phosphoric acid is worth eight cents. The whole vast business of manufacturing artificial fertilizers rests on the discovery of a method of converting insoluble phosphoric acid into soluble phosphoric acid. But the manufacturers of fertilizers have not yet discovered any cheap method of converting insoluble nitrogen into soluble nitrogen. This must be done on the farm. And the same process that will decompose the organic nitrogen and render it soluble will also render the phosphoric acid much more available, and consequently enhance its value.

To truckers, gardeners and fruitgrowers this subject should be of special interest, because a supply of soluble and readily available manure is of great 1mportance. Of the large quantities of manure they annually use it is quite clear that they do not get half or a quarter the effect that the plant-food it contains is capable of producing, simply because it is not in an available condition. We want to convert nitrogen, which we can buy or make for seven cents per pound, into nitrogen which we cannot buy for less than eighteen cents per pound, and for which, as a matter of fact, we often have to pay-or at any rate do pay-twenty-five or thirty cents a pound. And so with the phosphoric acid. We can buy it in tankage and coarse bones for three cents a pound, while we pay not less than eight cents per pound for it in ordinary fertilizers; and it is practically better worth the eight cents when soluble than three cents when insoluble. If this were not the case we should not keep on paying over twenty million dollars every year for soluble phosphoric acid. That farmers and gardeners can convert insoluble nitrogen into soluble nitrogen, and thus double or treble its value, there is no sort

Several of our experiment stations have shown that when manure is fermented and afterward exposed to drenching rains a very large percentage of nitrogen is washed away. And they earnestly condemn the practice of fermenting manure. They seem to overlook the fact that, according to their own experiment, the insoluble nitrogen has been converted into soluble nitrogen by fermentation, or it would not be dissolved and carried off by the rain. It is the abuse and not the use of fermentation that they should condemn. When we have succeeded in making the nitrogen soluble we should put the manure on the land, or keep under cover, or in heaps so deep that there is never rain enough falling on the surface to more than saturate the heap. In other words, we should do as a great many good farmers have done for the last hundred years or more. But during the last dozen years a great flood of light has been thrown on this subject. know now, it least in part, what causes the decomposition or fermentation. We The honey season has now passed as have not space here to go into details. also be necessary to add some plain acid

> FARM AND GARDEN NOTES. A garden must have good drainage. It never injures an orchard to manure

phosphate to increase the growth of the

yeast plant and to prevent the escape of

ammonia till it is converted into nitrate.

Be sure the strawberry bed is well drained.

Make a garden of your farm as far as possible.

Clean out the current bushes and other mall fruit plants. A family without a garden deserves public commiseration.

Corn fed cattle have not been plentiful in the early part of the present sca-Whenever a horse's head is raised out

of its natural position the animal suffers. High checking is hurtful. Is the stock in the back pasture having the core that will get them into win-

ter quarters in good shape. Even more than knowledge of how best to produce crops do we need knowledge of how best to utilize them.

Those who grow Lima beans claim that no other farm crop brings in as many dollars to the acre, but they require "heaps of work."

Breathing into the nostrils of a horse when he draws his breath has a wonderful effect in allaying his fear and calming his temper when excited. Rake up the cobs once every ten days

and burn till well charred, then put out the fire by throwing on water, sprinkle with salt and let the pigs feast.

Have a lock of nice hay or lick of meal in the manger each night and mornphoric acid, per pound insoluble in ing for the cows, and there will be no need of sending a dog or tired and cross hired hand after them.

SCIENTIFIC AND INDUSTRIAL.

Boston, Mass., has the largest fly-

Tiny incandescent lights are now made

for surgical uses. Electric weilding has been applied to to the manufacture of projectiles for

light guns. Two Maine women have discovered an acid that bleeches wood pulp designed to used in the manufacture of paper.

The Calumet and Hecla Works have smelting works in Buffalo, N. Y., the capacity of which will be 250 tons per month.

When you are floating through ice fields in the ocean you go very slowly. The Jeannette drifted through the Arctic Ocean at the rate of two miles a day. The wear upon Cape Cod, Mass., coast is shown to be at the rate of 755,-

756 cubic yards per year, or an annual wear of the coast equal to a distance of about eight feet. G. W. Dunn, the California naturalist, has collected over 70,000 insets belonging to the horn-winged family, 5000 of the cricket tribe and about 4000 but-

terflies, and numerous rare plants and aninals. A rack railway seven miles in length is under construction on the Usni Mountain, Japan, to connect the termini of the State railway at Yokohama and Karnisawa. There are twenty-one tunnels, 12,200 feet in length in all, along the line, and the steepest grade is one

to fifteen. A recent improvement in making barrels consists in making each alternate stave of soft wood and somewat thicker than the others. When the staves are put together and the hoops driven down, the hardwood staves are thus crowded into their softer neighbor, making a tight joint.

A new saddle has series of spring connecting the upper saddle-tree, or seat, with the lower, to relieve the rider from constant jolting. The springs are cone shape, working within each other, are of tempered steel, so as to work freely wherever the motion of the horse may bring the weight of the rider.

The hair that is taken from hides at tanneries has found a new use. Formerly this hair was of little value. By a new process it is taken from the hide by a machine which at the same time cleanses it, and it is then baled and sent to the factory, where it is utilized in making cloth "all wool" and a yard wide.

A sixty-seven-ton gun on board the British armored vessel Howe has developed a defect in the inner tube similar to that recently found in one of the big guns of the English ironclad Anson, the flagship of the Channel Squadron. The Admiralty is greatly exercised over the repeated discoveries of defects in British

The absolute conversion of tar into gas can now be effected without leaving any residue in a retort. The process consists in injecting a spray of tar by means of a Korting jet supplied with superheated steam into a red-hot retort half filled with coke. The gas has a high candle-power and does not need the use of expensive enriching material.

The injury of metallic sleepers from corrosion has been greatly overrated. Even in the damp climate of the Netherlands the loss from corrosion does not, it is said, exceed four per cent. in twenty years. Experience in India shows that metallic sleepers which are subjected to a special treatment before leaving the works are thoroughly to be relied on for efficiency and lasting wear.

The new artificial quinine produced by Messrs. Grimaux and Arnaud, of Paris, is mentioned as one of the greatest discoveries of the year. It is obtained by treating the base cuprein of a Brazilian shrub with sodium, then treating the resulting compound with chloride. of methyl. The product is quinine absolutely identical with the substance that has become so familiar and so indispensable.

A Wonderful Steam Engine.

It was in 1874, I believe, that D. A. A. Buck, an ingenious mechanic of Worcester, Mass., constructed a perfect steam engine of such lilliputian dimensions as to gain for its maker the plaudits of the world. To go into exact details, the engine, boiler, pumps, governors and all were so exceedingly small as to only occupy a space seven-sixteenths of an inch in diameter, or about the area of an old fashioned silver three-cent piece. It was only five-eighths of an inch high, yet it contained 148 distinct parts, nearly all of which were silver and gold. It was held together by fifty-two screws, the smallest being but one one-hundredth of an inch in length. The engine had all the valves, gearing, etc., to be found on the ordinary horizontal engine. Three drops of water filled the boiler! The engine weighed but fifteen grains when clear of the base plate. The diameter of the cylinder was but one-sixteenth of an inch; length of stroke, three flity-seconds of an inch. -St. Louis Republic,

Lamb-Gourd of Samara.

In a book called "The Dake of Holstein's Travels Into Persia and Muscovy," published in 1836, there is an account of a curious vine product called the "lamb-gourd," which runs as follows: "In the neighborhood of Samara, Russia, there grows a gourd which closely resembles a lamb in all its members. It changes place in growing as far as the stalk will reach, and wheresover it turns the grass withers and dies. This change of the gourd-plant the Muscovites call 'feeding;' they further say that when it ripens the stalk withers, and that the outward rind of the gourd is then conveyed with a sort of wool, which they use instead of fur." Scaliger also makes mention of the lamb-gourd, and says that it grows until the grass fails and it then dies for want of nourishment. He also says that the wolf is the only animal that will feed upon it. -St. Louis