Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors

PUBLISHED WEEKLY AT

No. 361 BROADWAY, NEW YORK.

O. D. MUNN. A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

One copy, one year, for the U. S., Canada or Mexico.....$3 00
One copy, six months, for the U. S., Canada or Mexico..... 1 50
One copy, one year, to any foreign country belonging to Postal Union. 4 00
Remit by postal or express money order, or by bank draft or check.
MUNN & CO., 361 Broadway, corner of Franklin Street, New York.

The Scientific American Supplement

is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly. Every number contains 16 octavo pages, uniform in size with SCIENTIFIC AMERICAN. Terms of subscription for SUPPLEMENT, $5.00 a year, for the U. S., Canada or Mexico. $6.00 a year to foreign countries belonging to the Postal Union. Single copies, 10 cents. Sold by all newsdealers throughout the country. See prospectus, last page.

Combined Rates.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for one year, to any address in U. S., Canada or Mexico, on receipt of *seven dollars*. To foreign countries within Postal Union, *nine dollars a year*.

Building Edition.

THE ARCHITECTS AND BUILDERS EDITION OF THE SCIENTIFIC AMERICAN is a large and splendid illustrated periodical, issued monthly, containing floor plans, perspective views, and sheets of constructive details, pertaining to modern architecture. Each number is illustrated with beautiful plates, showing desirable dwellings, public buildings and architectural work in great variety. To builders and all who contemplate building this work is invaluable. Has the largest circulation of any architectural publication in the world.

Single copies 25 cents. By mail, to any part of the United States, Canada or Mexico, $2.50 a year. To foreign Postal Union countries, $3.00 a year. Combined rate for BUILDING EDITION with SCIENTIFIC AMERICAN, $5.00 a year; combined rate for BUILDING EDITION, SCIENTIFIC AMERICAN and SUPPLEMENT, $9.00 a year. To foreign countries, $11.50 a year.

Spanish Edition of the Scientific American.

LA AMERICA CIENTIFICA E INDUSTRIAL (Spanish trade edition of the SCIENTIFIC AMERICAN) is published monthly, uniform in size and typography with the SCIENTIFIC AMERICAN. Every number of *La America* is profusely illustrated. It is the finest scientific, industrial trade paper printed in the Spanish language. It circulates throughout Cuba, the West Indies, Mexico Central and South America, Spain and Spanish possessions—wherever the Spanish language is spoken. $3.00 a year, post paid to any part of the world. Single copies 25 cents. See prospectus.

MUNN & CO., Publishers,
361 Broadway, New York.

☞ The safest way to remit is by postal order, express money order, draft or bank check. Make all remittances payable to order of MUNN & CO.

☞ Readers are specially requested to notify the publishers in case of any failure delay, or irregularity in receipt of papers.

NEW YORK, SATURDAY, APRIL 9, 1892.

Contents.

(Illustrated articles are marked with an asterisk.)

Agricultural inventions, recent. 234
Air, compressed, in Chicago..... 226
Aluminum as a coin..... 229
Astronomical lecture, illustrated* 223
Bicycle, the Lovell diamond safety..... 228
Capillarity, experiment in*..... 226
Cave dwellers, ancient, in Asia.. 232
Caviar..... 229
Cement floors..... 228
Corundum wheels, to clean..... 232
Drainage of a small lake..... 225
Flowers, artificial coloration of.. 232
Fruits and nuts, tropic and semitropic..... 228
Glacier, Muir, Alaska*..... 227
Glass manufacture in Belgium.. 233
Hydrostatic paradox, a*..... 230
Inaudi, the calculator*..... 230
Inventions, recently patented... 234
Inventors, a word to..... 226
Inventors, foreign, discrimination against..... 224
Irrigation, the Las Vegas convention..... 225
Lacquer, a tar asphalt, for iron.. 229
Lobsters, artificial propagation of..... 224
Manufacture, the future of..... 228
Mathematical expert, a wonderful*..... 230
Mirage, detecting a..... 229
Moon, a trip to the*..... 223
Notes and queries..... 234
Oil burner, the Shipman Co.'s*... 226
Old people, occupation for..... 229
Paper barrels, how made..... 232
Patents granted, weekly record.. 235
Peccaries, Texas, extermination of..... 225
Poisoning, chronic arsenical..... 233
Rifle sight, Parker's*..... 226
Rope traction for cable roads*... 231
Rust, railway..... 228
Watson, Sereno..... 233
Wheel, a great rope traction*.... 231

TABLE OF CONTENTS OF

SCIENTIFIC AMERICAN SUPPLEMENT

No. 849.

For the Week Ending April 9, 1892.

Price 10 cents. For sale by all newsdealers.

PAGE

I. ARCHÆOLOGY.—Constantinople Art Treasures.—By Prof. ALBERT L. LONG.—Valuable relics of ancient art as displayed under the auspices of the present Sultan of Turkey..... 13565
II. BIOGRAPHY.—The Father of Modern Physics.—Portrait and biographical note of Galileo.—1 illustration..... 13570
III. BIOLOGY.—Removal of Gold by Fungoid Growths.—A curious reaction between fungoid growths and solutions of gold..... 13565
IV. CHEMISTRY.—A Rapid Method of Determining the Composition of Lubricating Oils.—By HAROLD GRIPPER.—Application of saponification to oil analysis, with full table..... 13573
Boron.—The amorphous form of this element as investigated by M. Moissan..... 13573
Fat Extraction Apparatus.—By ALFRED SMETHAM.—A fat extraction apparatus utilizing upward percolation.—1 illustration.... 13573
Fermentation.—A recent lecture by Prof. ARMSTRONG on the phenomena of fermentation.—A very valuable abstract of his conclusions..... 13572
Iron Rust.—The presence of magnetic oxide of iron in iron rust. 13574
Pedetic Motion in Relation to Colloidal Solutions.—By WILLIAM RAMSAY.—Osmotic pressure and pedetic motion, and the effect upon them of an electrolyte..... 13574
Valuation of Aluminum and its Alloys.—By Herr F. REGELSBERGER.—Commercial analysis of aluminum alloys and determination of their prominent constituents..... 13572
V. ELECTRICITY.—An Interesting Electrolytic Phenomenon.—The production of light in electrolysis..... 13569
Generating Stations and their Physical Hazards.—By GEO. P. LOW.—The relations between electrical engineers and the underwriters.—A practical paper on the proper erection and conducting of a station and distributing plants..... 13568
The Hopfner Electrolytic Direct Process of Copper and Silver Reduction.—A direct reduction of copper and silver from their ores by the use of chlorides..... 13569
VI. GEOGRAPHY.—Korea.—Interesting extracts from a recent paper on a journey to Northern Korea..... 13569
VII. MEDICINE AND HYGIENE.—Italian Experience with the Pasteur Method for Hydrophobia.—Success attending the Pasteur inoculations in Milan..... 13570
The Management and Care of Patients with Hemiplegia Resulting from Cerebral Hemorrhage.—By WILLIAM M. LESZYNSKY, M.D.—One-sided paralysis, with diagnosis and treatment..... 13571
VIII. METALLURGY.—Different Methods of Tinning.—Three typical methods of tinning described..... 13562
IX. MINING ENGINEERING.—The Temescal Tin Mines.—By ENOCH KNIGHT.—American tin mines in Southern California.—An operative American tin mine..... 13564
X. MISCELLANEOUS.—A Singular Clock.—A clock which works by rolling down an inclined plane.—2 illustrations..... 13563
XI. PHOTOGRAPHY.—A New Telescopic Photographic Lens.—A recent achievement of Dallmeyer. Wonderful results obtained in photographing distant objects.—Reproductions of the work.—9 illustrations..... 13566
XII. NAVAL ENGINEERING.—Life Saving Devices.—Some more products of the London *Graphic* competition.—Various methods of saving life from wrecked vessels.—7 illustrations..... 13560
H. M. S. Blenheim, the New First Class Protected Cruiser, on Her Trial Trip.—A beautiful illustration of the sister ship of the Blake.—1 illustration..... 13559
The Cruiser Troude.—A new fast cruiser recently completed at Bordeaux.—1 illustration..... 13560
XIII. PHOTOGRAPHY.—Photo-Engraving.—How the photographic details of the process should be conducted.—Valuable practical hints..... 13564
XIV. TECHNOLOGY.—Glazing or Lustering Bodies.—Production of finishing compositions for cloth..... 13563
Resins, Waxes, and Solid Paraffins.—By Prof. A. H. CHURCH.—Valuable *resume* of the commercial products falling under these classes..... 13561
Teaseling. Exact details of how woolen nap goods should be teaseled.—The importance of doing it correctly..... 13564
The Cheap Production of Hydrogen Gas.—Commercial production of hydrogen gas from iron and water..... 13562

PROPOSED DISCRIMINATION AGAINST FOREIGN INVENTORS.

A dispatch from Washington says, at the request of the House Committee on Patents, General Berdan has prepared and submitted to the committee a bill to equalize the cost of patents to inventors in the United States and in foreign countries. In an argument before the committee General Berdan said that in England a patent costs about $800, and runs fourteen years, while in this country a patent can be had for $35, and runs for seventeen years. General Berdan said that many English inventors took out patents in this country, as well as at home, and he asserted that they should be charged the same for taking out a patent in the United States that it costs them in England. The bill, it is said, was favorably received by the committee.

The idea of compelling Englishmen to pay more for patents in this country than our own citizens, because the British fees for patents are larger than ours, is very old. Under the law of 1836 and up to the year 1861, the subjects of Great Britain were required to pay $500 on filing an application for an American patent, and all other foreigners $300. If the application was rejected, two-thirds of the sum paid was refunded and one-third retained by our government.

In 1861 this law discriminating between the inhabitants of the United States and those of other countries was repealed, and the same fees were established for all applicants, namely, $15 on filing the application for patent and $20 payable in the event of an allowance of the patent. If no patent is allowed, the applicant loses the first fee of $15, which is supposed to cover the cost of the official examination.

Prior to the year 1861, the number of patents granted to Englishmen was quite small, varying from twelve to twenty patents in a year. Dating from the reduction of fees in 1861 to the present time, the yearly number of patents to Englishmen has gradually increased. In 1880 the number issued to them was 275; in 1890, it was 721. Of all foreigners, the English take the largest number. Germany comes next, with 452 granted in 1890; Canada, 371; France, 178; Austria, 71; Switzerland, 56; Sweden, 32; very few to other countries.

The total number of American patents issued in 1891 was 23,244. It will thus be seen that the ratio between patents granted to Englishmen and other foreigners, as compared with the total number of issued patents, is very small. Whether it is desirable to return to the old, abandoned system of discriminating against foreigners is very questionable.

The theory upon which we grant patents, and the object of our patent laws, is the promotion of useful arts and industries, not the taxation of inventors. The aim of our patent law is to encourage the study and development of new inventions whereby multiplied and diversified forms of novel industries are made accessible to the people; for by industry they thrive. The American law, as it stands, invites inventors throughout the world to bring hither their new inventions, and set up their new industries; in reward for so doing, it grants them a patent for seventeen years, after which the invention becomes free to the public.

The larger the number of patents granted, the greater will be the number of new industries established, and our measure of prosperity correspondingly increased. As a people we have everything to gain and nothing to lose by encouraging inventors, no matter where they live or where they were born. The price that other governments charge for their patents may be proper subject for diplomatic negotiation; but it has no bearing or concern with the industrial laws of our own country.

The proposed bill we regard as unnecessary and uncalled for. It is unwise. It is legislation for the repression of industry and inventive genius. Nations that are so short-sighted as to adopt such measures undoubtedly subject themselves to industrial losses. They are not examples for the United States to follow.

ARTIFICIAL PROPAGATION OF LOBSTERS.

During the past ten years there has been a great falling off in the supply of lobsters, until the price has increased fully one hundred per cent. This applies alike to the New York market, to the waters along the New England coast and in Canada and Newfoundland, where lobster fishing and canning is an important industry. The necessity for increasing the supply of lobsters is generally recognized, and two methods are proposed for accomplishing this object. One is the enactment of laws which will check the depletion of the lobster beds by over fishing and the other is artificial propagation.

Marshall McDonald, who is at the head of the United States Fish Commission, says: "I have always felt that the maintenance of the lobster fishery rested more essentially upon proper regulation of the matter by the States than upon any efforts in the way of artificial propagation. The most usual regulation is that prohibiting the sale of lobsters below certain dimensions; the minimum limit, though varying with the different States, being smallest in Massachusetts. In Maine, where the law is enforced and the minimum fixed, I believe, at ten inches, the result has been a marked improvement in the lobster fisheries during recent years."

A law was enacted by the New York Legislature in 1880, prohibiting the taking of lobsters smaller than ten and a half inches, but it was repealed, largely, it is said, by reason of the efforts of a hotel keeper in New York City with political influence, who was determined to serve small lobsters on his table, regardless of the effect of rescinding the regulations.

The difficulty of securing legislation on this subject of enforcing the laws when they are enacted, and preventing their repeal through the efforts of persons who have no regard whatever for the consequences of their acts, compels those who desire to see the supply of this wholesome food fish kept up to look to artificial propagation as the most available method for securing the object desired.

In the volume entitled "The Fishery Industries of the United States," by G. Browne Goode and associates, the following statement is made regarding the cultivation of lobsters:

"The artificial propagation of lobsters has been rarely attempted, either in this country or in Europe, and in no case are we aware of its having been productive of satisfactory practical results. There are so many difficulties to overcome in an undertaking of this character, and the breeding habits of lobsters are so imperfectly understood, that it is not surprising that greater progress has not been made in materially aiding the increase in supplies by artificial culture, as in the case of the oyster and of many of our true fishes. That further study and persistent efforts may yet afford us the means of accomplishing so desirable an object is very probable, and is sincerely to be hoped for, in view of the apparent great decrease in the abundance of lobsters on many portions of our Atlantic coast."

Since the above opinion was expressed considerable success has been achieved in the line of artificial propagation. The United States Fish Commission's hatchery at Wood's Holl, Mass., provides about three million young lobsters each year, and these are all placed in Vineyard Sound and Buzzard's Bay, owing to the impoverishment of the species in that vicinity.

For three seasons lobsters have been hatched in small numbers at the station of the New York Commission, Cold Spring Harbor, L. I. Last season 27,700 were placed in the water at that point. The embryos are very delicate, and when lobsters are placed on ice, as many are which come to market, the embryo is generally ruined for hatching purposes.

Fred. Mather, superintendent of the Cold Spring hatchery and a man of wide experience in fish propagation, said recently that lobsters were not only decreasing in numbers, but also in size. A two pound lobster was now considered a fair average.

New York is next to the largest receiving market for lobsters in the country, yet the lobster fisheries within the boundaries of the State are not now important, and are confined to eastern Long Island. In former years lobsters were found in large numbers in New York Bay and at Hell Gate. The disappearance of this food fish is due mainly to over fishing, but also to the establishment of manufactories, which have polluted the waters. Lobsters were taken at Robins Reef, New York Bay, as late as 1879, but they were small and were not exposed for sale.

Lobsters are sold in New York during the entire year, but the demand is five times greater during July, August, and September than during any other three months of the year. The demand is the least during February and March. The consumption of lobsters at Coney Island in summer reaches 3,500 pounds a day.

The experience on the coast of Maine seems to be similar to that already stated. In 1890 twenty million of lobsters were taken, which was a falling off of five million or twenty per cent from the catch of 1888 and ten per cent from 1889. There has also been a steady decrease in the size of the fish sent to market. During 1889 and 1890 the average length of lobsters offered for sale was 10½ inches and the average weight two pounds. Ten years ago the average length was 13 inches and the weight three and one-half to four pounds. There are thirty-six factories on the coast of Maine where lobsters, sardines, herrings and mackerels are packed.

Considerable progress has been made by the Newfoundland Fisheries Commission in the way of lobster propagation. The work was taken up two years ago when the methods of the United States Fish Commission were adopted and their experience was made serviceable. A hatchery was located at Dildo Island. In the summer of 1889 4,039,000 lobster eggs were hatched, and the young lobsters planted around the head of Trinity Bay, the eggs having been obtained from lobster packing establishments in the vicinity. In prosecuting this work, Adolph Nielsen, superintendent, made the discovery that lobsters had two different times for spawning. The larger run of lobsters spawn from the middle of July till the middle of August, while the smaller and middle sized ones spawn during the latter part of October and the month of November. The commissioners make the following

statement in their report regarding the importance of the artificial propagation: "A means is thus provided which, if duly put into operation, will safeguard our lobster fishery from the injury or ruin which has overtaken so many of these industries in other countries, and already threatens our own. By establishing a lobster hatchery, or more than one, in each bay, the stock of lobsters may not only be maintained, but greatly increased; and at the same time, these valuable crustaceans may be planted in waters where at present they are not found, and their culture indefinitely extended." At Placentia Bay, Newfoundland, alone, 1,200 men and women are employed in the lobster industry. Five million is the annual catch, which represents $180,000 in value. Superintendent Nielsen has constructed floating hatching boxes by the aid of which it is possible to hatch lobsters when the eggs have reached a due stage of ripeness. By this means the immense number of eggs which are usually destroyed at the canning factories can be hatched, and thus the supply of lobsters be kept up. The average number of fertilized eggs carried by a lobster in the spawning season is placed at 12,000 to 18,000. The export of lobsters from Newfoundland has grown from 25,814 pounds in 1874 to 3,360,672 pounds in 1888, and the value from $124,997 in 1880 to $472,524 in 1889.

For the year 1890 the Newfoundland Commission state that success in the artificial hatching of lobsters exceeded their most sanguine expectations. There were 432 floating incubators in use, which were distributed at fourteen different stations. The percentage of loss in the apparatus was 28, as against 49½ in 1889. The result of the season's work was 406,005,300 young lobsters hatched and planted in good condition. "In the method now employed," say the commissioners, "we have obtained an invaluable means of arresting the decline in our lobster fisheries, which in many places threatens entire extinction, and of sustaining the stock of this valuable crustacean."

The depletion of the lobster fisheries has been especially noticeable in Canada. The report of 1888 showed a decrease in the value of exports of $350,000, as compared with the previous year, although there had been an advance in the price of 25 per cent. The value of the Canadian lobster fishery in 1888 was $1,483,388; in 1886, $2,638,394; in 1885, $2,613,731.

Superintendent Nielsen, of the Newfoundland fisheries, is a native of Norway, and his success in propagating lobsters has attracted a great deal of attention. In addition to artificial propagation, he believes in a closed season, when the lobsters will have a chance to propagate.

Lobsters are the more easily exterminated because they frequent shoal water within certain well defined areas, and are therefore the more easily captured. This fact renders the artificial propagation the more important, because the exhaustion of the species is rapid and certain.

The Las Vegas Irrigation Convention.

BY H. C. HOVEY.

An expert agriculturist, in whose company we crossed the great plains intersected by the Santa Fe route, exclaimed, concerning the arid regions of the Southwest, that boundless prosperity awaited them as soon as the irrigation problem should be solved. Granted a salubrious climate, wonderful scenery and inexhaustible soil, where is the water to come from? This very question that perplexed my Minnesota friend drew a convention of about 300 representative men to the opera house at Las Vegas, in the middle of March, whom we fortunately met before they were scattered again to the corners of the Territory. We also were guests at the Montezuma hotel, on the occasion of the grand "irrigation banquet," with which their three days' meeting ended. Thus we had an opportunity not only to discuss the grave problems of political economy, but also to watch at a safe distance the fantastic mazes of Mexican dances, and to see the most brilliant society of the Southwest. It should be added that the hotel is located near the noted thermal springs to which the aborigines resorted ages ago, and is attractive alike on account of its romantic environs and its admirable management.

The Las Vegas convention met pursuant to the suggestion made by the national irrigation congress held last September in Utah. By the courtesy of Governor Prince and Col. T. B. Mills, chairman of the executive committee, we were put in full possession of the proceedings, as well as of valuable facts, some of which will doubtless interest the general public. Incidentally it may be mentioned that a prominent place in the extensive library of Col. Mills is assigned to the bound volumes of the SCIENTIFIC AMERICAN, which he regards as an able ally in the work of developing the resources of our entire country.

Few may know that throughout these arid regions are the ruins of an ancient system of irrigation, that ages ago made this wilderness blossom as the rose. The autochthons who inhabited those curious houses on cliffs and in the jaws of caverns constructed acequias on levels so admirably surveyed as to be hardly improved on by all the appliances of modern science. In the country of San Juan, and elsewhere, the prehistoric aqueducts run side by side with the government ditches, and the cement with which they were laid is as firm and hard as if it had been spread last year instead of centuries ago. The vast plateaus that were thus made fertile in an era commonly described as barbaric should certainly be redeemed anew by this age of civilization.

Irrigation is no novelty, although comparatively little has been known of it in the Eastern States, and in large portions of Europe. The fact is that, to-day, more than half mankind subsist by means of irrigation, without which they could not till the soil that now yields them ample harvests. This explains the densely peopled areas of Asia. There are said to be 1,700,000,000 acres of arid land in the United States (not including Alaska); and of this vast area fully 76,000,000 acres lie within the bounds of New Mexico, sixty per cent of which acreage is thought to be susceptible of irrigation. Mining, the lumber business, and other important factors of public welfare, are to be estimated at their full value. The same is true concerning the raising of cattle and sheep, and other branches of industry. But after all the universal cry throughout the Territory seems now to be for water, and many are of the opinion that progress will mainly depend on the answer made by science and liberal legislation. Oddly the successful experiments in irrigation have thus far been in the four corners of New Mexico, while its great central regions are yet left without the needed supply. More than fifty companies have been organized to utilize and properly distribute the waste water through these thirsty acres. It has been demonstrated that water enough flows in sixty days of each year through the valley of the Rio Grande to inundate the entire arid area to the average depth of two feet. One half of that amount, added to the average annual rainfall, will insure the perfection of all crops, making a total of 33 inches, allowing for evaporation. There are enough natural reservoirs, with a little additional outlay, to store all the water that now runs to waste. There is a single basin for such a natural reservoir, west of Albuquerque, thirteen miles long, four miles wide and a hundred feet deep. The water that might be stored between these natural banks would irrigate seventy-five miles of territory as far south as the Mexican line. That reservoir could be fed from the Rio Grande by a ditch fifty miles long. Another natural basin near Las Vegas, four miles long, two miles wide, and a hundred feet deep, could be filled from the Moro, Sapillo, and Gallinas rivers by ditches from ten to twelve miles long. There are many smaller basins scattered over the Territory. It has also been proved that great bodies of subterranean water underlie a large part of the region, which could be tapped by artesian wells. Thus it is certain that the land could be well watered throughout by the use of the proper means.

As illustrating possibilities we may refer to what has been done in the Pecos valley, where, from reservoirs (one of which is seven miles long and two miles wide) 400,000 acres are now under successful irrigation. About 100,000 acres of the great Maxwell grant and about 30,000 of the Montoya grant are irrigated. The results for last year were wonderful. The soil of the Maxwell grant is especially adapted for beet culture. But it is found desirable to restrain the growth of the crop. Beets are capable of attaining an immense size, but at the cost of sweetness. A beet that weighs three and a half pounds contains all the saccharine matter possible—all above that weight being found to diminish the proportion of sugar. By judicious irrigation Mr. Pelles, the manager of the Maxwell grant, got 15 per cent of saccharine matter from 100 weight, the average yield being 18 tons per acre. It costs but little more to raise sugar beets than corn; but the return, at the above rate, would be from $75 to $100 per acre. As the basis on which the sugar factories buy the beets is at the rate of $4.50 per ton, with 10 per cent saccharine matter, of course the yield in New Mexico, as already stated, would be proportionally more remunerative. There are in the United States seven sugar beet factories, that produced, in 1891, 27,000,000 pounds of refined sugar. In that same year we imported $90,000,000 worth of sugar. The people of New Mexico claim that that amount could be raised in their Territory alone, with irrigation, and allow a surplus for exportation. They refer also to the fact that the importation of raisins in 1891 amounted to $20,000,000; and affirm that this entire amount could be raised here with due irrigation. An arid country is needed for drying raisin grapes in the sun; for the cost of artificial drying would be too great. The profit from raisin culture is from $200 to $300 per acre, and the only parts of the United States suitable for it are Southern California, Arizona and New Mexico. In Eddy County, N. M., as the direct sequel of recent irrigation, one grower has this year planted 1,200 acres of raisin grapes. Somewhat similar statements might be made concerning the cereals, alfalfa, and all kinds of fruits.

The object in giving the foregoing facts is to explain why there is such enthusiasm in this region on a subject that elsewhere may be more safely regarded with indifference. In conversation with the governor, secretary, surveyor-general, and other officials, the opinion was most positively expressed that the future of the Southwest mainly depended on the solution of the irrigation problem. And the same conclusion was unanimously voiced by the resolutions passed at the Las Vegas convention. The settlers on the great plains have invested millions of dollars, not as speculators, but as home seekers, only to discover that the most fertile lands in the world are worthless without water. What can a farmer owning but 160 acres, or even 1,000 acres, do individually toward remedying this deficiency? Generally he is powerless. The recent laws of the United States operate to prevent the formation of great monopolies for reclaiming wide regions of arid land. The new States and Territories are hindered in many ways from developing their best resources. Most of the public domain, not yet sold or otherwise disposed of, can only be cultivated by costly canals, reservoirs or artesian wells. The mountain snow fields, the deep canons, and the raging torrents, can hardly become private property, or even the property of ordinary corporations; and yet these are the original sources of irrigation. The outlay required is so vast that the general government can hardly be expected to reconcile the more favored regions of the North and East to consent to any adequate plan. Yet fears of the complications that might arise were any other method adopted than by governmental control cause considerable opposition, on the part of some persons, to plans of a different nature and that commend themselves to the majority of those who are most deeply interested.

Every shade of sentiment was brought out at the Las Vegas convention. But after a three days' discussion a series of resolutions was adopted, with I believe but one dissenting vote, declaring in favor of having the United States cede to the States and Territories within whose boundaries are located the "arid lands," all lands of this description, on condition that each State or Territory shall at once begin the proper work of irrigation, pledging such portion of said lands as may be necessary to raise funds, but finally selling them to none but actual settlers. The resolutions also contemplated having the timber lands, mining lands, etc., ceded likewise, to aid in reclaiming irrigable lands, or to go to swell a general school fund. In brief the resolutions indorse the bill introduced by Senator Warren, of Wyoming, for turning the arid lands over to the States and Territories on condition that they shall redeem them through irrigation.

Other business was transacted of a more strictly local character; and, in an informal way, the convention expressed itself as in favor of early statehood for New Mexico, as solving many of the vexing problems that are now so discouraging and that deter the best class of immigrants from seeking homes within its borders, as they might otherwise do.

Drainage of a Small Lake.

From the Cleveland offices of the Lake Superior, Cleveland and Pittsburg & Lake Angeline mining companies it is announced officially that work on the project of draining Lake Angeline has begun under a contract calling for its completion in five months, so says the *Marine Review*. The lake covers an area of 153 acres, and has a maximum depth of 43 feet, with a mean depth of 20 feet. The lake is owned by these companies, whose mines are already being worked beneath it, the Lake Superior and Cleveland companies controlling about equal portions of all but about one-fifth of the property, which is owned by the Lake Angeline company. This large body of water is being removed as a matter of safety to the present underground workings, but there is no telling, of course, what may be done in the way of further development of the properties when the water is out of the way. The companies undertaking this work are among the strongest in the mining business of Lake Superior, and there is little doubt that it will be carried out successfully. The contractor is C. B. Howell, of New York. A crib will be sunk while the ice is still on the lake. A centrifugal pump having a 20 inch suction and a 22 inch discharge, with a capacity of 15,000 to 20,000 gallons a minute, will be used, and the water will be discharged into the Carp River.

Extermination of the Texas Peccaries.

A recent publication of the National Museum contains a paper, by Mr. Frederic A. Lucas, on animals recently extinct or threatened with extermination. He finds that in nearly every instance the cause is "reckless slaughter by man." As an instance of the way in which animals may be destroyed, he refers in the introduction to peccaries. In 1885 these little animals were so abundant in several counties of Texas that their well-worn tails were everywhere to be seen, while their favorite haunts could be readily picked out by the peculiar musky odor characteristic of the creatures. Shortly after that date, hogskin goods being in favor, a price of fifty cents each was offered for peccary hides, with the result that by 1890 the peccaries were practically exterminated.