

JAMES WILSON PRACTICAL FARMER AND HIS LIFE WORK

"Tama Jim's" Characteristics and Some of the Results Achieved Since He Has Become Head of the Great Agricultural Department of the Government of the United States.

TAKE 'em year in and year out, no employe of the government sticks to his job with more effective fidelity than a certain cabinet officer whom you may know by the familiar sobriquet of "Tama Jim." This is James Wilson of Iowa, secretary of the Department of Agriculture. He is the dean of the cabinet. He is the only member of the cabinet of the McKinley administration from its start, having been confirmed on March 5, 1897. It is very likely, if the republicans continue in power, that Mr. Wilson, if he pleases, will remain at the head of the Agriculture department. His administration of his department has been so singularly void of offense and pregnant of far-reaching usefulness to the country that there are many democrats who, in the event of the success of their party next November, would ask that Mr. Wilson be urged and permitted to stay where he is so long as he is not weary of the well doing which has distinguished him the dozen years he will have spent in his present office. Mr. Wilson takes but few vacations. He is often the highest officer of the government remaining in Washington. Midsummer finds him at his desk. It is because he has his heart in his vast work and because he is enjoying the fruition of wonderfully varied tests and experiments in the vitalizing arts of husbandry that keeps him loth to leave his official quarters to which continually come reports from field and farm of absorbing interest to him because they are almost invariably stories of local achievement contributing to a great national progress.

James Wilson, the secretary, was born within a few miles of the birthplace of Robert Burns, the matchless farmer poet, in Ayrshire, Scotland, just seventy-three years ago last Sunday, August 18, 1835. He came to America when he was 17 years old, stopped with his parents awhile in Connecticut, and removed to his present home in Tama county, Iowa, in 1855. He has always been an enthusiastic farmer and at the same time has been actively concerned in all legislation affecting agricultural interests. He was that as a member of the Iowa legislature, in which he served several terms, and continued so as a member of congress, in which he served three terms as a member of the house. He served on the Iowa Railway commission four years and for six years before he accepted a place in President McKinley's cabinet was director of the agricultural experiment station and professor of agriculture at the Iowa Agricultural college at Ames.

Characteristics of the Race

Mr. Wilson has all of the Scotsman's fondness for the practical things of well being and all of the Caledonian's enthusiasm over the triumph of shrewdly directed industry. He is one of the most interesting men who ever held office in the government. Simple and unaffected in conversation, he has a store of experience and a ripe fertile memory for practical things worth remembering which combine to convince all who know him of a staunch superiority of mind and character devoted to the general welfare exceedingly scarce among men who hold high political office.

His department is indeed less inoculated with partisan bias than any in the government. There are not a few democrats who hold responsible positions in the department, but Mr. Wilson talks to them about their work, and not about their politics. It is said that he does not know the party affiliations of a dozen men under him. Some of his most zealous supporters are democratic members of congress. Still, Mr. Wilson, if Bryan should be elected president, has said he would expect a democratic president to choose all the members of his cabinet from his own political party.

Just before Secretary Wilson left for a short vacation at his western farm he was elated over the assurance of a great year for farm production throughout the country.

"The crops this season," he said, "will be the largest and best in our history, unless all signs fail. All reports indicate that the farmers throughout the country are preparing for an unprecedented harvest. Farm hands will be in great demand, the railroads will have few empty cars, and the cotton crop of the south will be great. Why shouldn't we farmers smile?"

While "Tama Jim," like Bobby Burns' cotter, is ready to hymn his Creator's praise for generous sunshine and vitalizing rains, and for the energy and intelligence of American farmers, he takes a natural pride in the widespread fruitful aid given by the Department of Agriculture in vastly diversified directions, which have made many a farm, but recently neglected as scarcely worth the labor given it, bloom and ripen into such varied harvests as to rejoice the heart of its owner.

Bureau of Soils

Especially gratified is the secretary with good results achieved through the operations of the bureau of soils, under Prof. Milton Whitney. This is the branch of the department which is in closest relation to the farmer. It is the foundation of his well being. In the language of a soil expert, who has reason himself for pride in the work of the science of agriculture, it has no middlemen and it speaks what the soil tiler can understand, so that few have wondered when the powerful opposition of the appropriations committee was overthrown at the last session of the house of representatives and an increased sum was voted to be put into the hands of Prof. Whitney for the acceleration of soil surveys. Although still but in its initiative the results obtained by the bureau of soils have already closely interwoven themselves with the daily work of the farmer and have solved planting problems in a way which harvests have strikingly illuminated. The latest phase of soil study which has been taken up will, in the opinion of the student workers, prove the greatest boon yet enjoyed by the tillers of the ground.

In nothing connected with the revelations of tests founded upon the chemical knowledge has more light been shed than upon the old problem of fertilization. From the earliest days fertilization of the soil has been one of the most important and absorbing questions with the farmer.

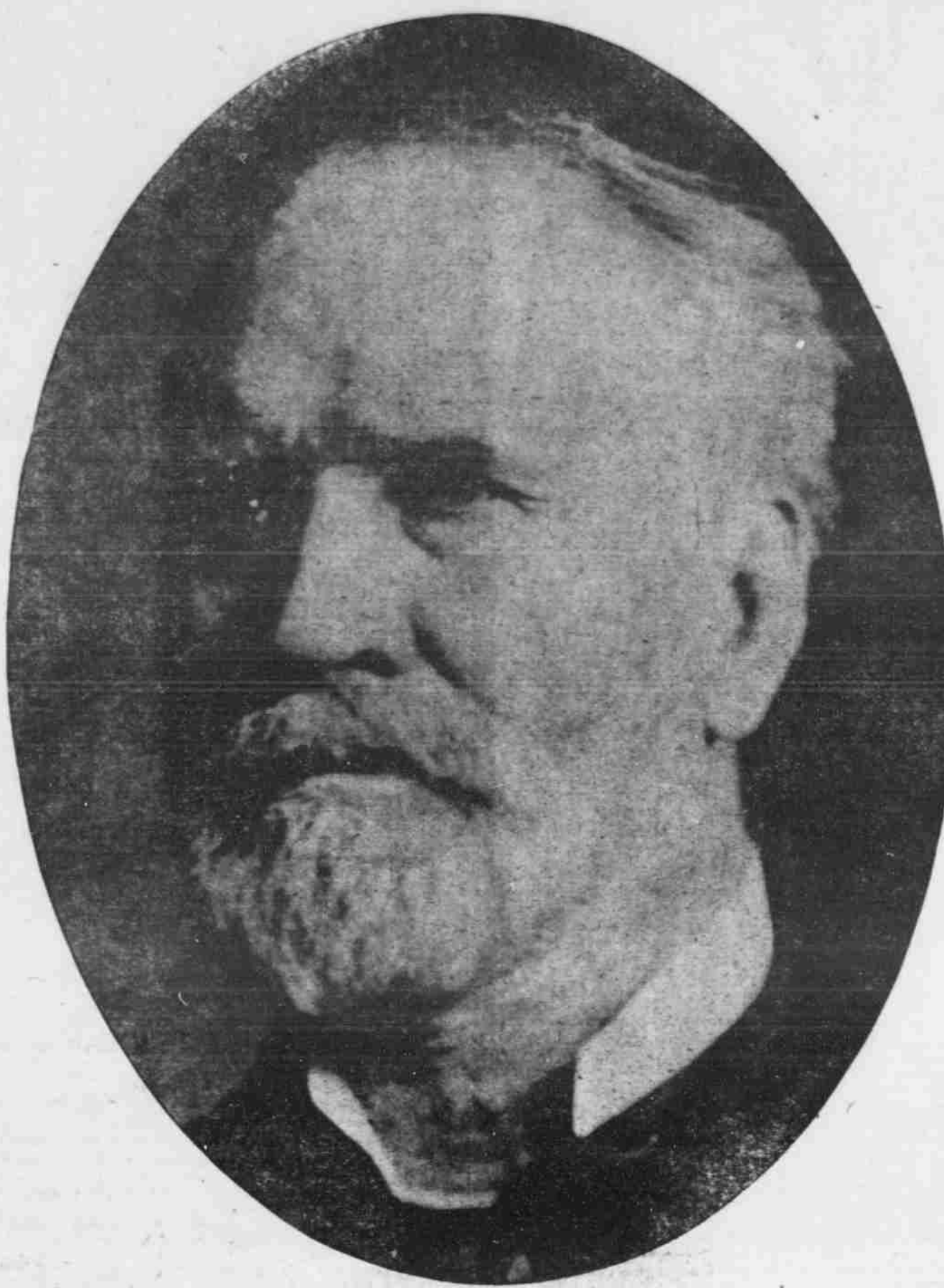
It is certain, according to the erudite department authorities, that ancient agricultural people worried over it, and that maybe Cincinnatus, when called from his plow handles to the helm of state was pondering this very question. It is likewise held that in all old-time discussions and experiments there was a vital part of the problem which remained undiscovered.

The bureau of soils has found that plants often kill off succeeding generations in the same soil, not by exhausting it and extracting all the nutrition, but by depositing toxic or poisonous substances which always hamper and frequently prevent the growth of the succeeding plant. So, instead of devoting all its time to replenishing the ground with those elements and substances which have been given off during the growth of the plant, the bureau has pursued its experiments of the theory of isolating and removing the poisonous matter. The discovery of these hurtful substances disclosed that with all the necessary mineral or nutrient elements native to the soil the plant would not flourish. After a series of experiments the character of the toxic elements was chemically identified and there immediately began the revolution in soil treatment by the bureau which continued until it has uncovered the poisonous excreta of all the most useful plants. The evil has been counteracted successfully by the discriminating use of chemicals and fertilizers and the farmer, it is claimed, has been freed from a presence more baleful a thousand times than the boll weevil to cotton or the natural exhaustion of the land.

Help for the Farmer

Thus far the toxic properties have been removed in many instances by a number of simple operations. The experiments are proceeding with all possible expedition, the object being to afford the farmer a cheap and convenient method of making his land yield the greatest possible uniformity of profitable production year in and year out. The farmers of the country are as a rule co-operating cheerfully and intelligently with the department and the chief of the bureau of soils. Prof. Whitney is greatly encouraged, feeling that the importance of the work is properly appreciated by those whom it most concerns.

Experiments are constantly going on with commercial fertilizers also, with the view of supplying a particular fertilizer for each type



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which will replace all the nourishing elements taken from the plant in the course of its life. As there are more than 460 different kinds of soil in the United States, this will be no easy task, but great progress has been made, and already a number of sections have been advised by the bureau just what elements the soil requires to be tickled to yield a maximum harvest.

Commercial fertilizer is used chiefly in the Atlantic and Gulf states, and since 1899 its use has doubled in this country, until now \$100,000,000 is annually spent for this kind of soil improvement.

It is not alone in the bureau of soils that the Department of Agriculture is putting in its best work. There is the bureau of animal industry, which has become one of the most important of the departments and has in its employ an army of expert inspectors, not alone in the packing houses to watch and inspect the evolution of live stock from the moment of arrival in the stock pens to the killing, curing, preservation and refrigerating departments, but in the field, inspecting live stock on the cattle ranges and feeding lots. In fact a constant governmental supervision is had over live stock from its birth, care, shipment, nutrition to the abattoirs, where it becomes the meat of commerce. The brand of approval affixed to a carcass by Uncle Sam's inspectors is the guaranty of excellence that is taken as the standard the world over. Greater care is now taken in the inspection of live stock on foot and in the packing houses than ever before. The inspectors have become better versed in their work and consequently more exacting, at times much to the chagrin and

annoyance of the packers, but always for the public good. So perfect has this governmental inspection become that, rinderpest, Texas fever, pleuro-pneumonia, foot rot, trichina, hog cholera and kindred live stock diseases have ceased to be alarming, and even diseases and maladies of the glanders order among draft stock have been conquered by the industry of Tama Jim and his army of intelligent and watchful assistants.

Bureau of Plant Industry

The bureau of plant industry is another of the great accomplishments of the Department of Agriculture. Wonderful strides have been made through this bureau in the better production of tobacco, cotton and tea, and the introduction of new food and forage plants, their propagation and acclimatization and in seed distribution. In connection with the bureau of plant industry is that of entomology, which is waging a constant and interminable warfare against the insect pests that beset the farmer and horticulturist and thus involve millions of dollars of loss to the agricultural industry of the country annually. Scarcely has the entomological bureau got the better of one insect pest until another appears, requiring new experiments with varied success, but in the main tremendously beneficial and saving annually to the farmers of the country more than the entire appropriations made for the maintenance of the Agricultural department.

Another great bureau is that of the forestry service for the

preservation, propagation and growth of forest reserves, at the head of which bureau is Gifford H. Pinchot, who is in the work from a sheer enthusiastic love of it. This is in truth a conservation of the natural resources of the country and it has been a pet hobby of Tama Jim's for many years. This work is proving to be the most responsive to intelligent effort of any of the great bureaus of the Department of Agriculture. An army of men is employed in the work in the forests already existing and another army is engaged in planting and caring for the young trees in the experimental forests and preventing trespass on these baby forests, some of the largest of which are located in Nebraska and are gradually evolving into a most gratifying success.

Problems of Forestry

The forestry bureau has been up against it hard recently in the disastrous forest fires in the northwest. The overcoming of these fires is a problem yet in its incipency. Their prevention is the easiest thing in the world but for the carelessness and indifference of hunters and campers, through whose criminal carelessness most of these fires originate. Spontaneous combustion is an occasional cause, but it is so rare as to be classed as an actual cause. It has been demonstrated time and again that the accumulation of undergrowth in the great forests is a fruitful danger in propagating the spread of forest fires. The forestry bureau is now considering the most effective plans for getting rid of this undergrowth and it is likely that a force of men will be put to work in the forests cutting out and destroying this tangle of undergrowth wherever possible. It is believed by Mr. Pinchot and his assistants, and particularly by Secretary Wilson, that the forest fire problem can be as easily handled as the prairie fire problem of a few years ago. All that is needed is the intelligent and careful co-operation of people living in the vicinity of the forest reserves in watching for incipient fires, and to make it a felony for hunters or tourists to permit their camp fires to linger after they have left their camps.

Since becoming a part of the Agricultural department in 1891, when it was transferred from the War department, the weather bureau has developed into one of the greatest bureaus of the department and one of the most important. Under the intelligent management of Chief Willis L. Moore the weather bureau has rendered incalculable service to the Agricultural department. Its value is manifested in its forecasts, frost possibilities and warnings. Weather stations have been established in every hamlet and village in the agricultural areas. Daily reports and warnings are given, and with the evolution of the telegraph, telephone and rural free delivery the farming communities are put into instant communication with the weather bureau with the same facility as in the commercial and trade communities. The approach of cold or hot waves is announced with the same care as in the commercial centers and the farmers are rapidly availing of this valuable information. Secretary Wilson has found an enthusiastic coadjutor in Chief Willis L. Moore and the weather service is becoming daily more important to the farming and stock-raising communities. Its forecasts and warnings have already saved millions of dollars to the farming and stock-raising interests and its work has only just begun.

Safeguarding the Pantry

The bureau of chemistry is another of the Department of Agriculture's valuable adjuncts. It comes in close touch with many of the other departments and bureaus and under the able management of Prof. H. W. Wiley is second in importance to but few of the other bureaus. Prior to the passage of the pure food law the bureau of chemistry had charge of all of the chemical experiments and inquiries pertaining to the Agricultural department in the investigation and testing of foods, and through these investigations and tests, with the aid of the famous "poison squad" was the pure food law brought about. This bureau is still in active operation, covering many activities that cannot be reached under the pure food law provision.

The reclamation service, the irrigation service, the biological survey, covering the game birds; the division of publicity, the bureau of statistics and the vast number of experimental stations which embrace every species of plant, plant food, human food and miscellaneous experimentation, all come under the jurisdiction of the Department of Agriculture and have received their greatest impetus through the painstaking and conscientious energy of Secretary Wilson.

Last, but not least, of the great bureaus of the Agricultural department is the pure food laboratories, established to carry out the provisions of the pure food laws. Thirty-two of these laboratories have been located throughout the country, the greater number being in the central west, the great food-producing region of the continent. The ablest chemists of the country will be appointed to superintend the work of these laboratories, which are to be most elaborately equipped and furnished for the analysis of food products and drugs and everything that enters into human food consumption or for the cure of human ailments. The laboratories will aid in the testing of dairy and butter products, particularly such as process and filled butter, which are to some extent now under the supervision of the revenue departments.

The bureau of crop reports, of sanitation in dairies and everything that can contribute to the welfare of the great agricultural industries of the country are but another of the multiple duties that appertain to the Agricultural department and have reached their present perfection and efficiency through the untiring efforts of "Tama Jim."

Newest of Theories of What Constitutes Light

CAMBRIDGE, Mass., Aug. 29.—The theory of light pressure, the subject of discussion for some time past among astronomers, physicists and chemists, has begun to impinge itself upon popular consciousness and to appeal to the imagination of those who are by no means experts, who look back with pleasure and perhaps a little regret to the neatly boxed categories of the universal forces which were easily understood in the days before Sir Oliver Lodge announced "the astronomy of the atom."

It was made quite certain then by experiment as well as treatise that the undulatory theory was adequate to explain all the elemental forces. The ridiculousness of the antiquated hypothesis of minute corpuscles of matter shot off from illuminated bodies, of electric and magnetic fluids coursing through the veins of things was palpable. It gave pleasure to the youthful intellect to accept Huygens' doctrine of a universal ether which accounted for the propagation of light rays. It was good to know that the individual and indivisible atoms easily split out of molecules in the chemistry class had after all something to float around in. This was a dear old cosmos anyway.

Of all the well-behaved universal forces which the secondary school intellect loved to contemplate light has perhaps yielded up the most astonishing to laymen in recent years. Heat has been pursuing its way without startling aberrations. Sound always has been more or less of a pseudo force, a mere slow shuffling among molecules, useful for purposes of conveying intelligence, but not especially stimulating to the imagination. Of electricity queer things are expected anyway.

But light, so well behaved, so definite and so positive in the laboratory has been creating scandals among the makers of textbooks. New sections have had to be added to explain the ultra violet microscope. And now the books apparently

must be revised to include a theory which makes of the pressure of light a force co-equal in importance with gravitation.

Just whether Arrhenius, Lebedev, Hull and Nichols, whose names are associated with the recent discoveries of the cosmical significance of light pressure, have hit upon something as fundamental in the history of science as Newton's discovery of the law of gravitation it would be out of place to attempt to argue now. Enough that their theories have proved to be immensely suggestive that conservative astronomers like Prof. Edward C. Pickering at Harvard, whose work has lain in other than electro-chemical directions, are expressing themselves as intensely interested in the generalizations from the light pressure doctrine, that to most people the conception of light as a propulsive agent is still a new and even startling one.

That a beam of light theoretically ought to exert pressure upon whatever object it falls was evident in the days when the Newtonian theory of emission of luminous corpuscles was held by scientists. If a candle flame or a sun in burning threw off minute particles of material light clearly the impact of these traveling through space at a rate of 186,000 miles a second should be considerable.

Had earlier physicists possessed the apparatus to measure this force the overthrow of Newton's hypothesis might have been delayed. There was, however, no tangible proof that light actually did exert a push, and when the newer conception of sound, heat, light and electricity as modes of motion became definitely accepted most scientists forgot that there ever had been a hypothesis of light pressure.

Since 1845, when Faraday noticed that a strong magnet exercises a peculiar action upon polarized light, the science of light and the science of electricity have gradually come to overlap until

now it is hard to say just where the one ends and the other begins. Hertz showed that electric waves can be reflected, refracted or polarized; that in other words they have the characteristic qualities of light waves. Clerk Maxwell, in developing his theory that light consists of electric vibrations in the ether made some calculations as to the probable pressure exerted by rays of light.

Quantitative demonstration followed. The scientific precision which has enabled the measuring of differences in light velocity amounting to not more than one-millionth of a second of time has not proved wanting in the measuring of the weight of incident light. The Russian, Lebedev, first proved experimentally that light exerts pressure. Prof. Nichols and Hull, working at Dartmouth college, confirmed his experiments and improved his methods.

Meantime Svante Arrhenius of the University of Stockholm began drawing up statements of changes of cosmic theory that must take place now that a new factor in the framework has been demonstrated. A few of the consequences of the acceptance of the light pressure theory as seen by this Swedish scientist may be set forth.

The sunlight perpetually beating upon this planet, exerts, according to the measurements of the Americans, a pressure of about 75,000 tons. That is a merely negligible force as compared with the pull of gravitation, which is many times as great.

Out in the solar system, however, where there exists no one knows how tenuous a condition of the material filling in, the propulsive force exerted by the light upon any little particle of matter that is flying about may be quite as potent as the power of gravitation that tends to draw all things together. Light pressure, in other words, appears to be a foil to the universal get-together tendency.

Just why this force is relatively more important when acting upon minute than upon large

masses will be evident on a moment's consideration. Gravitation acts upon masses as a whole. Light pressure is exerted only on surfaces.

The more closely a certain number of particles of matter are compacted the less the surface that is exposed to pressure. If the same mass is spread out very thin by division and subdivision a condition obviously may be reached where the light gets as much of a purchase on the particles as gravitation holds upon them. In this neighborhood a particle that is one one-hundred-thousandth of an inch in diameter will be exactly balanced in space, pulled one way by gravitation, pushed in an opposite direction by the sunlight.

Now see what a reversal of high school notions regarding conditions in interstellar space is involved on acceptance of this principle, even if nothing had become public earlier to disturb the cheerfully simple belief that the earth's atmosphere somewhere comes to a stop—with a definite way surface like that of the ocean, we used to be taught—and that thereafter you encounter a vast void of ether, incredibly cold, until you arrive in the atmosphere of some other planet or in the veil of hot gases surrounding the sun. True, other recent pronouncements of the scientists have indicated that nothing much is boxed off in the universe, that it is hard to say just where either the earth's atmosphere or the sun leaves off, that the diffusion of hydrogen out from the air is a curious, not to say portentous, phenomenon—would not slow processes of electrolysis account for the gradual diminution of the earth's water supply more naturally than any sinking of the ocean into cracks of the earth's crust? It is suggested—and that with negatively electrified ions shooting all over space there must be lively happenings off there where we once pictured an imponderable, immeasurable, mysterious calm, punctuated by the occasional whiff of a meteor or the semi-occasional

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