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THE

TULE MARSH MURDER

STORY OF A MISSING ACTRESS AND THE TAXING OF WITS TO EXPLAIN HER FATE.

BY NANCY BARR MAVITY.

SYNOPSIS.

Don Ellsworth's wife, formerly actress Sheila O'Shay, disappears. Dr. Cavanaugh, criminal psychologist, identifies a charred body found in the tule marsh as that of Barbara Barnes, his daughter, faints when she hears him tell this to Peter Piper, a Herald reporter.

When Mrs. Kane, Sheila's maid, is arrested she admits that Ellsworth married Sheila under threat of breach of promise. A threatening note signed "Dr. Orme" is found. Peter tells Orme and attempts him. Peter sees Barbara destroy a jewelled comb of Sheila's and when she refuses to talk he realizes she is protecting someone. At Orme's trial Mrs. Kane states that Orme is Sheila's husband. Orme admits seeing Sheila on the night of her death. Dr. Cavanaugh takes the stand.

CHAPTER XLVII.

"Now doctor," the district attorney began with heavy reasonableness, "if the defendant's actions are fully explained by all this fugue and retrograde amnesia business, how do you account for his failure to make any mention of these occurrences on the witness stand?"

"I object!" Graham exploded.

"A moment ago my learned friend across the table was very meticulous about statements calling for the conclusion of the witness.

"If your honor, please, I should like to answer the question."

"I withdraw the objection," Graham subsided meekly.

"The most significant factor in Orme's life of recent years," Dr. Cavanaugh turned from the district attorney and addressed the jury conversationally, "has been the loss of two of his fingers. From a squalid childhood he had been lifted by his talent into a world of music—a world where he met some of the greatest names of Europe on a plane of congeniality and equality.

"At one stroke he was hurled out of that environment, hurled back into a poverty and a limitation far worse than that in which he started because it was now complicated by thwarted ambition. The result, in a man of his temperament, was a sense of inferiority—an inferiority actual and yet undeserved—which conditioned his entire life.

"It was for that reason that Mrs. Orme's skepticism regarding his musical ability moved him more powerfully than the cooling of her love and her attentions to other men.

"He transferred to the loss of his memory the same inferiority feeling of inferiority which had added him ever since the loss of his fingers. It was a further 'lopping off,' you see—another blow of fate stamping him as incomplete, as unable to hold his own with normal men.

"You must remember that we are here dealing all along with exaggerated reactions. In the short time at my disposal for treatment, I was unable to eradicate from David Orme's mind the idea that his 'flight from reality' in the form of a fugue was an act of personal and moral cowardice.

"It was not that, of course—it was absolutely beyond his control. But remember the tortured pride with which he endured the humiliation of rubbing sandpaper in a jazz orchestra when he had expected to take his place among the world's great violinists. He had dragged himself back from the temptation of suicide because he thought it cowardly to run away from life.

"And yet, enduring that depth of bitterness, he found that after all he had run away. Rather than admit that flight, with the moral stigma which he placed upon it, he was willing to let things take their course, even if his silence resulted in his conviction. Life, you see, was already a prison to him, and a sentence of death would offer him honorable escape, his final release."

For a moment, silence hung over the court room. Every mind was contemplating the vision of a tormented soul called up by the doctor's quiet and yet compelling earnest utterance. The district attorney was the first to shake himself free of the spell.

He shuffled his notes, coughed, changed his position.

"May I ask, doctor," he said, concealing his uneasiness under an air of ponderous assurance, "whether it is your custom to take your patients off the streets and give them a course of treatment at their mere request, with no assurance of their ability to pay for your services?"

"Your honor!" Graham sprang to his feet, finding relief in action. "Do I understand that the district attorney is attempting to impeach this witness?"

"What Mr. Graham understands is beyond my power to fathom, as I make no pretense of being a mind reader or a psychiatrist." The district attorney turned with vicious joy to an antagonist whose weapons he could parry with his own. "I think the question is proper cross-examination, your honor."

"The question is allowed."

Dr. Cavanaugh looked down at the district attorney with an invulnerable placidity, from which his intruded thrust glanced harmlessly aside.

"Of late years it has been my custom to take only such patients as interested me—and to take them wherever I found them. Fortunately I am no longer dependent on an income from my practice, as I believe I stated on direct examination, and am able to devote my time for the most part to special research. For some years I have been working on the problem of the relation of fugue states to genuine dissociation of personality. From that point of view I found Mr. Orme interesting."

"Oh, so you were very much interested in Mr. Orme's case!"

"Very much, yes."

"Well, doctor," the district attorney's bludgeoning voice went on, "isn't it a fact the scientific mind, like the musical mind, is subject to 'temperament'? In the enthusiasm of research, is it not frequently found that facts are interpreted to meet the hypothesis which the investigator is trying to prove?"

"That is sometimes true of some investigators, yes."

"Well, then," the district attorney paused a little in his approach to his goal, "what was to prevent David Orme, knowing the intense interest you took in his case, from making up the whole story which you have told us, and using it as a cloak of defence?"

"The main thing that prevented him was that he couldn't do it." So far as the doctor was concerned, the district attorney had evidently reached his goal, only to find that nothing was there.

"You have heard of malingering, doctor?"

For the first time, Dr. Cavanaugh permitted his smile to broaden.

"Yes, I have heard of malingering."

"How can you be sure that Orme was not malingering—deliberately concocting a story and imitating the symptoms of this fugue you speak of?"

"Again, if I may, I will resort to an analogy. Suppose you were to ask me to imitate the playing of Fritz Kreisler. If I made the attempt, the imitation, I venture to say, would deceive no one. Even if I deliberately prepared for the test and had a certain degree of skill, the result, while it might pass before hearers without musical training, would certainly be detected without difficulty by musicians.

"The imitation of a mental disorder, contrary to popular belief, is infinitely more difficult than the imitation of a master's playing. In fact, not even a student of the subject could possibly maintain the fiction for any length of time without giving himself away. The amateur who thinks that by grimacing and tearing his hair he is giving a convincing clinical picture of insanity is doomed to instant disappointment.

"Functional and organic derangements of the mind are as numerous and as complex in their differences as physical disorders, and their symptoms are as definite. You might as well ask the physician whether a patient down with typhoid fever or tuberculosis was not making a vague general pretense of being ill. I may add that my own experience has been fairly extensive, and that it has not been devoid of the malingerers of whom you speak. Their efforts were quite readily detected."

The district attorney glanced covertly at the jury. They were obviously impressed. He wished he had left that particular line of questioning unopened.

Graham was leaning back taking things as they came. He could set Dr. Cavanaugh up there and turn him loose! The district attorney inquired of the universe, not without silent profanity, why the devil they hadn't been able to hook Dr. Cavanaugh for the prosecution—then he would be sitting back, and Graham would be doing the worrying. He passed his handkerchief across the back of his neck, where the roll of fat stood out in a thick ridge. Then he leaned forward, moving to a new line of attack.

"Granting that all you say is true, doctor—and I am without the advantage of the technical learning necessary to argue the point with you—(the district attorney hoped that would have its effect on the jury, that they would see themselves and him together as allies, as plain men pitting their robust common sense against the hair-splittings of the academic expert) —there still remains no reason why Orme should not have had another impulse to knock Sheila O'Shay down. And why, having killed her with the blow, he should not have concealed and destroyed her body, as he thought—and then have conveniently suffered another loss of memory. Or let us say that the emotional crisis put him into that state of fugue again."

"I take it you mean to put that suggestion in the form of a question," Dr. Cavanaugh spoke before Graham could do more than grunt the beginning of a protest. "At any rate, I will answer it.

"It might have been physically possible for Orme to have left the Ellsworth grounds with his wife at half past eight, in accordance with Mrs. Kane's testimony have quarrelled with her and killed her, then have left her body lying casually about somewhere while he wandered about, and finally have returned for it and taken it to the marsh in a very clever and almost successful attempt to conceal his crime. That would be physically possible, but it would not be psychologically possible.

"No one in a state of mind capable of elaborating the plan for concealing the body in the marsh and setting fire to the grass in order to destroy it would have failed to carry through the plan at once."

(To be continued.)

Quality has no substitute

Tea *"fresh from the gardens"*

Punch and Judy

Round of a London corner,
Down of a London mews,
Back of the shout of the traffic
And the "mid-day special" news,
Out of the old hound numbers
In their much be-fingered row,
Are Judy and Toby and Baby
In Mr. Punch's show

Waterloo Bridge is sentenced,
Devonshire House is down;
The big white shop fronts face us
Like the streets of a foreign town;
Cupid's gone from the Circus,
Taxis rattle the Row,
Still, in a back street corner
There's Mr. Punch's show.

Pick up a crawling hansom,
—You'll find one close to the Park!
Follow the 'buseless byways,
When the first lights prick through the dark,
There's gathering crowd of children,
Their heads all turned in a row,
To the lost pre-cinema ages,
And Mr. Punch's show.

—Kathleen Coynyngham Greene, in "London Jingles."

Fort Lennox, Ile Aux Noix

Among the historic memorials of Canada that have been from time to time placed under the care of the National Parks of Canada of the Department of the Interior there are few richer in historical interest or more charmingly situated than the massive old fortress that stands in quiet dignity on Ile aux Noix on the Richelieu river in Quebec. Adequate measures for its preservation have been taken and to-day it stands as one of the chief monuments of the military romance of Canada and its island home as one of the interesting Canadian historic parks.

"Your husband is sulking again. What's wrong this time?"

"Oh, it's just because I used his silly old tennis-racket to strain the potatoes."

ROADWAYS

Like stone we form one roadway, and we shall crush each other if we do not uphold each other.

Hobbies

The orator who deals largely in quotations speaks volumes.

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More than that of any other member of the family, baby's tender, delicate skin needs the greatest care and attention. The soft soothing oils in Baby's Own Soap make it specially suitable for babies, and is clinging fragrance reminds one of the fields of France which help to make it.

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Rolls, coffee cakes, buns . . . there's no limit to the breads you can make with Royal Yeast Cakes and the new Royal Sponge* Recipe.

Royal Yeast Cakes keep for months. Be sure to have a supply on hand to use when you bake at home. Send for free Royal Yeast Bake Book. Standard Brands Ltd., Fraser Ave. & Liberty Street, Toronto, Ont.

Royal Sponge Streusel Cake*

To 1¼ cups *Royal Yeast Sponge** add 2 tablespoons butter, creamed, ½ cup light brown sugar, 1 egg well beaten, 2½ cups flour to make soft dough. Knead lightly. Place in greased covered bowl in warm place. Let rise until double in bulk (about 1½ hours). Roll out dough ½ inch thick, prick with fork, brush top with melted butter and sprinkle with Streusel Topping. Let rise in warm place about 30 minutes. Bake at 350° F. to 400° F. Makes 4 cakes.

Streusel Topping: Cream ¼ cup butter with ½ cup sugar and mix with ½ cup flour, ½ cup bread crumbs and 1 teaspoon cinnamon. Stir until dry and crumbly.

*ROYAL YEAST SPONGE—Soak 1 Royal Yeast Cake in ½ pint lukewarm water for 15 minutes. Dissolve 1 tablespoon sugar in ½ pint milk. Add to dissolved yeast cake. Add 1 quart bread flour. Beat thoroughly. Cover and let rise over night to double in bulk, keeping in warm place free from draughts. Makes 5 to 6 cups of batter.

Our free booklet, "The Royal Road to Better Health," suggests plans and ways to take Royal Yeast to aid in digestion. Use this simple yeast like this regularly for health. Write for it.

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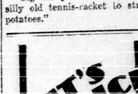

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"I'M going, anyway"

THE modern Miss needs no "time out" for the time of month.

If you've ever taken Aspirin for a headache, you know how soon the pain subsides. It is just as effective in the relief of those pains peculiar to women!

Don't dedicate certain days of every month to suffering. It's old-fashioned. It's unnecessary. Aspirin will always enable you to carry on in comfort. Take enough to assure your complete comfort. If it is genuine Aspirin it cannot possibly hurt you. Aspirin tablets do not depress the heart. They do not upset the stomach. They do nothing but stop the pain.

Headaches come at inconvenient times. So do colds. But a little Aspirin will always save the day. A throat so sore that you can hardly swallow is made comfortable with one good gargle made from these tablets. Neuralgia, Neuritis, Rheumatism. Pains that once kept people home are forgotten half hour after taking a few of these remarkable tablets. So are the nagging aches that bring fatigue and "nerves" by day, or a sleepless night.

Genuine Aspirin tablets cost so little after all, that it doesn't pay to experiment with imitations!

WITH THE LONE SCOUTS

Much interest has been evidenced in the new Boy Scout Catalogue of Official Uniforms and Equipment which has just been issued and a copy of which has been mailed to every Lone Scout in this province. It is certainly an attractive publication, and features a large variety of articles of interest to Scouts of all ages.

A notable feature is the remarkable reduction in the prices of uniforms and there also notice that there are quite a number of new books and other items listed.

Lone Scouts will not find any mention of the special Lone Scout Mauve Neckerchief in the catalogue as this colour has been reserved for the exclusive use of Lones in Canada. When ordering uniform, however, Lone Scouts should be careful to specify "Lone Scout Special Mauve Lone Scout Neckerchief."

Sir Ernest Shackleton's Scout

The scientific staff of the Antarctic research ship Discoverer II., now in the far South Seas, includes J. W. S. Marr of Aberdeen, a Scout selected to accompany Sir Ernest Shackleton on his last expedition to the South Pole in the Quest. Scout Marr also accompanied the Aitarson expedition to the Antarctic, and has since qualified for several university scientific degrees. He has made good.

Many Lone Scouts will envy the opportunities which have come to Scout Marr, and we would remind them that it was only because he worked hard and "qualified" as a good All-round Scout that he was selected in the first place.

Cenotaph Flag For New Zealand

A white ensign from the Cenotaph in Whitehall, London, was presented to the Scouts of New Zealand by Lord Baden-Powell, and placed for keeping in Christ Church Cathedral, Auckland. A similar flag, presented to Canadian Scouts at the last world Scout Jamboree, occupies an honoured place at Dominion Scout Headquarters, Ottawa, Dominion Headquarters at Ottawa have a number of interesting souvenirs from Overseas, including a beautiful Totem Pole, which Lord Baden Powell presented to the Canadian Contingent which attended the Jamboree in England in 1929. This totem pole was on exhibit at the Scout Booth at the Canadian National Exhibition last summer.

Next World Gathering of Boyhood

The dates for the next world gathering of Boy Scouts have been announced as August 1 to 13, of next year. The jamboree will be held in Hungary. It is expected that Canada will be represented by a contingent.

During the winter months it is often hard for a Lone Scout to find much to do to amuse himself, during spare time, especially if he is not a member of a Lone Patrol.

Patrols can organize Winter Hikes, Ski-ing Parties, Snow Fights and Skating Sports and have a lot of fun, but it isn't so interesting to do these things all alone.

We suggest therefore, that all the Lones, whether members of Patrols or not, should have a hobby. You will find that almost every successful man has a hobby of some sort or another, with which to relax his mind, during his spare moments.

In the winter months it is nice to have a indoor occupation, such as Fretwork, Wood Carving, Collecting Stamps or Autographs, etc., making rugs or bead work, straw plaiting, etc., some of which hobbies can be made into very profitable occupations.

A suggestion has been already made to you that you enter the Fisher Body Craftsmen's Guild coach building competition.

"Lone E" also has a number of autographs of famous people, and foreign stamps which we would be glad to send to any Lone Scouts who apply for same, to the Lone Scout Department, The Boy Scouts Association, 330 Bay Street, Toronto 2, from which address, also, full particulars may be obtained of how to become a Lone Scout. —"Lone E"

African Farmer Trains Baboons As Farm Hands

Cape Town.—Rivaling the wildest Jungle "yarns" in strangeness comes the thoroughly authentic news, as told in the Christian Science Monitor, of three baboons captured by a farmer in the Brits district and put to work weeding his land.

Baboons abound in hundreds in the mountain fastnesses along the Magaliesberg range, and farmers are sometimes obliged to set traps to rid themselves of the prowlers. Mr. Jan Engelbrecht, of Bokfontein, caught three of the wild creatures at various seasons. The first of these he called Japie. By the exercise of the greatest care and kindness, Japie was soon taught to yoke the oxen on the land, and later ever was to be seen at the head of his team walking down the village street.

Same time after, Mr. Englebrecht caught two young baboons and these, by the time they reached the age of 12 months, were proficient weeders of his farm land.

Mr. Englebrecht asserts positively that Hennie and Kaffer, as he has named the two baboons, are each of them equal to three natives for weeding a comparatively easy matter to install knowledge into their small heads, he affirms, provided gentleness and patience are employed. In teaching them to weed, they were taken to the fields and a particular weed was pointed up and showed to them. They would sit with solemn faces watching the actions of their teachers.

Then the weed would be taken into their two small hands. It was first carefully examined, then smelled, and immediately the willing weeders set to work to clear the land of that particular plant.

Their speed and thoroughness are said to be marvelous. If perchance they were set to work to uproot a particularly stubborn patch of grass they would pitch in with a will and refuse to stop until the last vestige of a root was removed.

Mr. Englebrecht's lonely farm is often visited by nature scientists and other inquiring folk anxious to see and speak for themselves to this strange phenomenon.

The Use of Words

The proper force of words lies not in the words themselves, but in their application. A word may be a fine-sounding word, of an unusual length, and very imposing form its learning and novelty, and yet in the connection in which it is introduced may be quite pointless and irrelevant, or of no power or pretension, but the adaptation of the expression to the idea that clinches a writer's meaning—as it is not the size or glossiness of the materials, but their being fitted each to its place, that gives strength to the arch; or as the caps and nails are as necessary to the support of the building as the larger timbers, and more so than the mere showy, unsubstantial ornaments.—From "On Familiar Style," by William Hazlitt.

Memories of Canada

From a New Year card sent to former pupils in the Dominion by Miss Mary Tweedie, Headmistress of Edinburgh Ladies' College, one of the twelve British Headmistresses who toured Canada last summer.

We've wandered—here in Europe,
In Norway and in France
In Germany, and Italy
The lands of old romance;
But we never met the vigor
Nor the eager spirit found
That wrapped up round our gaily
On the fair Canadian ground;
The snow-peaked hills and prairies,
The mighty waters' roar
The land of orchard blossom,
And far Vancouver's shore.
The tall, unclanding forests
And the tales of men of yore.
Fill our hearts with dreams of beauty
And our minds with nature's lore;
And the people are our kinsmen,
Showing us a kinsmen's love
Which we render in full measure
To that land where still we'd rove.

Edinburgh. —Mary Tweedie.

Brazil Hopes to Restore Democratic Rule in Fall

Rio De Janeiro.—After fourteen months of a dictatorial government under Provisional President Getulia Vargas, Brazilians are hoping to return to a constitutional regime before the end of 1932.

It appears likely that the new enrollment of voters and the constitutional convention will have passed in time for the country to return to a Democratic government on October 24, 1932, two years to a day from the overthrow of President Washington Luis Pereira de Sousa.

The provisional government is credited with being both idealistic and practical. Many economies in administration have been made. Like other one-crop countries, Brazil has suffered greatly through the drop in the world price of coffee, the greater part of which is exported to the United States. This price drop and the fall in the value of the milreis, from nine to sixteen to the dollar, has affected adversely the income not only of the coffee growers but also of the federal government.

Fossilized Apples Unearthed in Alberta

Olds, Alta.—While fossilized palm leaves figs and fig leaves have been uncovered in southern Alberta, as proof that around 70,000,000 years ago this part of the West was a tropical land where the dinosaurs roamed, yet it was not until last month that petrified apples have been unearthed.

This discovery was made by a farmer digging a well in the Olds district, who unearthed petrified apples on a petrified branch of the ancient tree. The Calgary museum has been notified of the discovery and the well has been refilled with earth to await further excavation work by experts in this branch of research.

Steam Heat Used For Calves In State College Experiment

New York.—When the steam-heated calf barn was built at the New York State College of Agriculture some considered it an artificial method of raising calves, but C. H. Crawford of the department of animal husbandry says the first year's use of the barn has been satisfactory and that the college has never had calves which grew better or were as free from disease as this year's crop.

"Before the barn was built the dairymen chose the months of May, June, September and October as the time calves grew best and we then planned to keep the temperature of the barn at about average temperature of those four months," says Mr. Crawford. "The barn is kept at about 55 degrees Fahrenheit in Winter by the steam pipes and by forced ventilation, when necessary.

"Few farm-reared calves actually die of cold but many are forced to burn their body reserves to keep warm. When this condition is continued the calf stops gaining and grows but little. The calf's resistance is lowered and it is more susceptible to disease."

Too Large

The little ones are not happy always;
Ours is a grown-up world planned for a race
Of tall folk; imagination's small maze
Of melody and colour has no place
To spread its little tent. The lovely eyes
Of children are not happy, are not gay
Always; it is a world too great in size,
Too huge for the gnome's song and the elf's play,
Too coarse for the little ones to nest their dreams
And make believe; too chill, often, for those
Who are as fragile as the tulip's seams
Kin to the moonlight and the meadow rose.
I sometimes wish God had desired to make
A little planet—for the children's sake!

—Bert Cooksley in the New York Times.

German Bobsledders Crash Second Time

Germany's bobsledders had their second serious accident on the Olympic slide when the four-man team crashed through a dangerous zig-zag curve. Captain Grau (at wheel) suffered fractures of shoulder, hip and skull and Albert Brehme (standing) injured spine and skull.

Women's Ability to Meet Change Called "Amazing"

New York.—Women are meeting every economic adjustment demanded of them with a gallantry and understanding as amazing as it is admirable, Miss Anne Morgan, president of the American Woman's Association, said in a radio talk over Station WJZ of the National Broadcasting Company

"While they are waiting for the new opportunities which must come," said Miss Morgan, "they must adapt themselves to the needs of the moment. So we have an actress and a home economics expert selling books, an art director acting as companion, a concert singer teaching French and Spanish and translating manuscripts for a publishing house. Accountants are serving as hostesses in tea rooms.

"Many women who had worked up from stenographers and secretaries to all sorts of executive and responsible positions are returning for the time being to the typewriter. One member has devoted herself with such energy to her hobby that she has equipped herself in the past year to make it her primary profession."

Women are making these adjustments for two reasons, according to Miss Morgan, first, because they need the money, and second, because they know that they must keep themselves active and interested, so that when the opportunity comes to return to work for which they are fitted, they will go back with the same alertness, energy and self-respect which previously made them capable of carrying responsibility.

Teachers Seek World Amity

Mexico City.—The National League of Schoolmasters has organized an affiliated association called Fraternidad Internacional to cultivate closer relations with the schoolmasters of other countries, especially Hispanic nations. One will be to combat teaching of history in such a form as to cultivate international animosity.

Colonization in Quebec

Le Progres du Saguenay, Chicoutimi (Que.): The first phase of the colonization movement is ended; the embryonic stage has given place to the stage of adolescence and full development. We do not think that we are straying far from the truth when we say that next autumn half of our colonists will be able to live comfortably on the revenue of their own lands. Some of them are going to sow 25 40, and 50 bushels of grain; others as much as 75 or 80. Add to this the precious produce of the garden, the farm-yard, the spinning wheel and the loom, and you will have to admit that these people suddenly becoming little kings in their own domains, would regard it as an insult to accept any of our unemployment relief money. Are they not better off than the majority of our farmers and practically all of our industrial workers? Can one deny that the scheme has been a great success and has proved a very practical way of solving, among other problems, the terrible question of unemployment?

Barber — "I'm forty-five years old."

Customer—"How old were you when you began to give me this half-cut?"

Goats!

The goat's not my favorite mammal.
Mr. Gandhi does on it I know,
It's milk is nutritious
And doubtless delicious,
But I don't like the critter's B. O.
—W. P. in the Boston Transcript.

Looks a Winner

Mrs. Eva Seeley and her lead dog Gripp, who are participating in the New England sled dog races at New Hampshire. If she wins she will take her dogs to Lake Placid for the Olympic races.

Latest Notes of Science

New Supply Sources — How Infinitesimal is Measured

Last week came the news that in "towsagis" the Russians have discovered a plant which will yield a rubber-milk with industrial possibilities.

After years of investigation and study Edison reached the conclusion that there are at least 1,500 plants that can be milked for rubber with some hope of commercial success. Probably ten times that number of plants contain gums of some sort. Considering the fact that the whole world has been combed for trees, vines and shrubs that will yield rubber in commercial quantities and of industrial quality, it seems highly improbable that towsagis is a species new to botany.

* * *

Measuring the Infinitesimal

Before the annual meeting of the American Institute of Electrical Engineers, C. W. LaPierre described a new application of the marvelously sensitive photo-electric cell. He has made it the principal element in an instrument so sensitive that it can measure a millionth of an inch.

And yet Mr. La Pierre's advice is positively coarse compared with the ultra-measurer of Professor R. Whiddington, an English scientist. Imagine a steel rod one-half an inch in diameter and twelve inches long. Imagine this rod held horizontally, with one of its ends in a vise and a fly on the opposite end. The weight of the fly will bend the rod and Whiddington's electrical instrument can measure the amount of the bending, provided that it is as much as one five-hundred millionth of an inch.

In automobile building it is an ordinary performance to caliper the ten thousandth part of an inch. In a few machine shops, where scientific instruments are made. Millionths of an inch are measured. The Bureau of Standards has a balance so delicate that the man who weighs with it must stand at a distance lest the heat of his body vitiate the readings. The late Professor Rowland's machine for ruling hundreds of thousands of lines on a square inch of surface to make what is called a diffraction grating is so delicate that it must be locked up when it starts working. The bolometer invented by Professor Langley to explore the invisible infra-red portion of the spectrum is able to detect the heat of a candle a mile away.

Probably the record for minute measurement is held by Professor Arthur H. Compton. He has determined the length of waves in X-rays to the five hundredth part of the diameter of a single atom. This means the hundred thousandth part of the millionth of an inch. A double X-ray spectrometer is the measuring instrument he uses.

* * *

Again the Cosmic Rays

Before an audience of a hundred scientists, among whom was Dr. Einstein, Dr. Millikan at Pasadena announced his intention of renewing the cosmic ray studies that he began ten years ago. Apparently this investigation is to be conducted independently of Dr. Compton's, which is to be world-wide in its scope.

Millikan, it will be remembered, believes that the cosmic rays result from the creation of matter in outer space. It must have been a dramatic moment in Pasadena when he turned to Einstein and acknowledged his debt to relativity. According to relativity, mass and energy are different forms of the same thing. Mass can be converted into energy. That is what happens when hydrogen is changed into helium. The conversion is not quite complete. A little mass is left over, and all this, according to the relativity theory, must be dissipated as energy. In the cosmic rays Millikan sees the excess energy.

Probably this question will never be settled until somebody actually transforms hydrogen into helium and obtains cosmic rays as a by-product. Meanwhile, Millikan proposes to gather more evidence to support his views. In 1922 he sent up sounding balloons to nearly ten miles at Kelly Field, Texas—balloons laden with sensitive instruments that noted the little electric shocks experienced when they were exposed to cosmic rays Millikan was able to show that the higher his balloons went the stronger were the rays. Now he wants to go higher than Piccard climbed in his record-breaking ascent.

Just as visible light consists of a gamut running from violet to red, so there are cosmic rays of different "colors." Some of these cosmic ray "colors" cannot penetrate our atmosphere. By sending up balloons to heights of fifteen or twenty miles it may be possible to discover them. They will throw light on the origin of the rays.

As matters stand, Millikan has made out a case for his theory. If it can be substantiated by still stronger evidence, it will be necessary to rewrite all the books on physics that have been printed in the last twenty years. Should it turn out that matter is in the process of creation as electrons and protons coalesce in outer space, all our beautiful theories of the evolution of the stars and the universe must be cast aside for totally new ones.

* * *

How Bright is the Sun?

Our notions of the relative brightness of sun, moon and stars are qualitative rather than quantitative. We know that to us the sun is brighter than any other celestial body but not how much brighter. In the new edition of its Meteorological Tables just issued by the Smithsonian Institution, Dr. Herbert H. Kimball of the Weather Bureau gives the information we want in terms of foot-candles—the amount of illumination received from a standard candle a foot away.

It is not very impressive to learn that the noonday sun has an intensity of 9,600 foot-candles at the surface of the earth, that the illumination from the full moon at its zenith is only two-hundredths of a foot-candle, and that starlight amounts to only eight hundred thousandths of a foot-candle. We are more reconciled to the figures if we express them in a different way. The sun seems to shine more brightly when we say that it gives 465,000 times as much light as the full moon overhead and that it is 120,000,000 times brighter than all the stars on a fine night. — W. K. in "The N.Y. Times."

Planning Safety Week; Has Fewer Accidental Deaths

London—Safety Week will be celebrated in London this year from May 2 to 8. The National Safety Congress will meet here at the same time.

During the first nine months of 1931 there were 433 fewer deaths in the corresponding period of 1930, caused by accidents recorded than the total number reported being 2,631 against 4,062. The reducing in the number of deaths was 10 per cent., while the decrease in the amount of traffic on the road was only 2¼ per cent.

King George to Have Dial Phones

London—King George has followed the Prince of Wales as a user of the dial telephone. St. James's Palace, where the Prince lives, has already recently been changed over and from now on Buckingham Palace will also have dial telephones. During the absence of the Court from London, postoffice engineers have been at Buckingham Palace effecting transformation from the old Victoria exchange to the new automatic Whitehall exchange.

Canada's Northern Population

In its more northerly areas of Canada the white population is as yet small, but it is ever increasing. According to the Department of the Interior in the areas north of the timber line are several bands of North American Indians, while the islands and northern coast lines are the home of the Canadian Eskimo. Within the Northwest Territories the latest census shows the population to be roughly 1,000 whites, 4,500 Indians, and 7,000 Eskimos.

Coffee Beans Transformed Into Coke in Brazil

Rio De Janiero.—The Brazilian Government, after having dumped several million sacks of inferior grade coffee into the Atlantic Ocean, both here and at Santos now believes it has found a medium of use for the bean.

Although experiments with coffee pressed into briquettes and used as fuel in locomotives of the national railways were not successful, it has now been learned that the same briquettes can be made into fairly combustible coke. Tests made so far with the coke have been entirely satisfactory, although further experiments will be made before coffee-coke production on a large scale will be tried.

"That picture is one I painted to keep the wolf from the door."

"Indeed! Then why don't you hang it on the knob where the wolf can see it?"

Russia Leads World In Sheep Production

Soviet Russia leads the countries of the world in the number of its sheep. There are about 124,000,000 sheep in Russia. Australia, with 105,000,000, ranks second; United States, with 46,000,000, third, and Argentina, with 40,000,000, fourth.

A man seldom makes money last if his father made it first.